



August 7, 2020

Mr. Jean-Pierre L. Oriol, Commissioner
Division of Environmental Protection
Department of Planning and Natural Resources
45 Mars Hill
Frederiksted, St. Croix, V.I. 00840-4474

**SUBJECT: Flare Management Plan Pursuant to NSPS Subpart Ja and
MACT Subpart CC – Revision 1**

Dear Mr. Oriol:

On behalf of Limetree Bay Refining, LLC, this Flare Management Plan (FMP) is being resubmitted for the #3 and #8 Flares at the Limetree Bay refinery in St. Croix, in accordance with 40 CFR 60.103a(b)(3) of the New Source Performance Standards for Petroleum Refineries (40 CFR 60 Subpart Ja) and 40 CFR 63.670(o)(1) of the National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries (40 CFR 63 Subpart CC). The FMP is being resubmitted, in accordance with 40 CFR 60.103a(b)(2), to reflect the inclusion of an alternative baseline for the startup of the Platformer #4, and includes other updates to the FMP since it was last submitted, in accordance with 40 CFR 60.103a(b)(2) and 40 CFR 63.670(o)(2)(ii).

As you know, the refinery has not yet resumed operation of the refinery and flares. Therefore, the information in the FMP continues to be based on best available information as of the date of this submission. Once the refinery and flares resume operation, Limetree Bay will update the FMP, as needed.

Please contact Catherine Elizee at (340) 692-3073 or celizee@lbenergy.com if you have any questions regarding this submittal.

Regards,

A handwritten signature in black ink that reads "Catherine Elizee". The signature is written in a cursive style.

Catherine Elizee
Environmental Supervisor

cc: U.S. Environmental Protection Agency – Office of Air Quality Planning and Standards via
Email refinerynsps@epa.gov and refineryRTR@epa.gov.
Verline Marcellin (DPNR)



Limetree Bay Refining, LLC
St. Croix, US Virgin Islands

Flare Management Plan

Flare #8

Flare #3

1 Estate Hope
Christiansted, St. Croix, USVI

August 2020
Revision 1 - Update to January 30, 2020 FMP

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SECTION 1 INTRODUCTION

1.1 Background

This Flare Management Plan (FMP) provides the information required by the New Source Performance Standard (NSPS) Subpart Ja and Maximum Achievable Control Technology (MACT) Subpart CC (NSPS Ja and MACT CC, respectively) for Flare #8 and Flare #3 at the Limetree Bay refinery located in Christiansted, St. Croix, United States Virgin Islands.

The refinery has been reconfigured since it was last operated in 2012. Therefore, the information in the FMP is based on engineering estimates, rather than actual operating data. The FMP will be updated, if necessary, to reflect changes based on actual operations. A cross-reference table between the regulatory sections and the sections of this plan is included in Appendix A.

SECTION 2

FLARE SYSTEM DESCRIPTION

2.1 General Description of the Flare System

Simplified process flow diagrams (PFDs) of Flare #8 and Flare #3 (Figures B-1 and B-2, respectively) are included in Appendix B. Table 2.1 provides a description of each flare's configuration and design parameters.

Table 2.1 Flare Configuration and Design Parameters

Flare Name	Flare #8	Flare #3	Citation
Flare Type	Elevated	Elevated	§60.103a(a)(3)(i)(A), §63.670(o)(1)(iii)(A)
Elevation (feet above-grade)	230	200	
Type of Assist System	Steam	Steam	§60.103a(a)(3)(i)(B), §63.670(o)(1)(iii)(A)
Flare Tip Type	Complex – Staged, Multi-Tip	Simple	§60.103a(a)(3)(i)(C)
Cascaded Flare System	No	No	§60.103a(a)(3)(i)(D)
Backup Flare	No	No	§60.103a(a)(3)(i)(E)
Flare Usage	Non-Emergency, used on a routine basis	Non-Emergency, used on a routine basis	§60.103a(a)(3)(i)(F), §63.670(o)(1)(iii)(A)
Equipped with Flare Gas Recovery	No	No	§60.103a(a)(3)(i)(G) §63.670(o)(1)(iii)(A)
Maximum Vent Gas Flow Rate	1,500,000 lb/hr	185,000 lb/hr	§60.103a(a)(3)(iii), §63.670(o)(1)(iii)(C)
Design Smokeless Capacity	140,000 pounds of hydrocarbon vent gas in a 15-minute block period with a MW of 45.2 lb/lb-mol (basis is a 0.2 S:VG mass ratio)	27,788 pounds of hydrocarbon vent gas in a 15-minute block period with a MW of 49.7 lb/lb-mol (basis is a 0.3 S:VG mass ratio)	§63.670(o)(1)(iii)(B)

Note: lb/hr – pounds per hour, MW – molecular weight, S:VG – steam to vent gas ratio

2.2 Flare Tip

Flare #8 is an elevated derrick with a platform consisting of 41 staged burner tips. Stages 1 through 5 are multi-point, individually steam-assisted, flare burners. Each stage has its unique number of dedicated burners, and each of the 40 burners are identical in size. Stage 6 consists of

a single unassisted 36-inch diameter flare tip atop a central vertical riser with full circumference stability tabs. Flare vent gas routed to Flare #8 flows continuously to stage 1 consisting of 4 burners. As the vent gas pressure and flow increase, additional stages are automatically opened sequentially. Stages 1-5 have 4, 4, 7, 11, and 14 burners respectively, and are steam assisted with each burner having eight (8) radially orientated steam ports surrounding the central vent gas opening of each burner. In relief cases, excess flow is directed to the base of the central 36-inch flare stack; i.e.: stage 6. As the pressure in the header increases, flow control valves to stages 2 through 6 open at various pressure set points.

Flare #3 is an elevated flare with a simple 36-inch diameter steam assisted tip. Flare vent gas routed to Flare #3 flows through a velocity seal to the flare tip. Steam is provided to the tip as both center and ring steam.

Depictions of the flare tips are found in Figures C-1 and C-2 of Appendix C¹. These drawings are considered Confidential Business Information (CBI) by the flare tip vendors and are only included in the printed version of this FMP maintained onsite². The following table summarizes the design of the Flare #8 and Flare #3 tips.

Table 2.2 Flare Tip Description

Flare Name	Flare #8	Flare #3	Citation
Manufacturer	John Zink	Zeeco	§60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)
Date of Installation	1992	2019	
Nominal Tip Diameter (inches)	Stage 1-5: 4" each burner Stage 1 – 8.0 Stage 2 – 8.0 Stage 3 – 10.58 Stage 4 – 13.26 Stage 5 – 14.96 Stage 6 - 36	36	
Effective Tip Diameter (inches)	Stage 1-5: 3.9" per burner Stage 1 – 7.80 Stage 2 – 7.80 Stage 3 – 10.32 Stage 4 – 12.93 Stage 5 – 14.59 Stage 6 - 33	34	

¹ §60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)

² Per e-mail correspondence between U.S. EPA and industry representatives dated October 28, 2015.

2.3 Flare Header System

The flare headers at the refinery, as depicted in Figures B-1 and B-2 of Appendix B, collect and route process unit, ancillary equipment, and fuel gas system gases from locations throughout the refinery to Flare #8 and Flare #3.³

Table 2.3 Summary of Process Units, Ancillary Equipment, and Fuel Gas Systems Connected to the Flare #8 Header

Unit Number	Abbreviation	Name
3100	CDU 5	CRUDE UNIT NO .5
3201	LPG 1	LPG TREATER NO. 1
3301	BOIL 6,7,8,9	UTILITY AREA NO. 3 - BOILERS 6, 7, 8, 9
3400	GT	POWERHOUSE NO. 2 (GT4-GT13)
3700	BOIL 10	UTILITY AREA NO. 3 BOILER 10
4100	CDU 6	CRUDE UNIT NO. 6
4810	LOA - DOR	LEAN OIL ABSORBER / DISULFIDE OIL RECOVERY
4820	LPG 2	LPG TREATER NO. 2
4830	ARU 4	AMINE UNIT NO. 4
4840	HPFGT	H.P. FUEL GAS TREATER
4850	GRU 2	GAS RECOVERY UNIT NO. 2
4860	LPG 3	LPG FRACTIONATION UNIT NO. 3
5830	ARU 5	AMINE UNIT NO. 5
3202	DIP	DEISOPENTANIZER / IC5 SWEETENER
4200	VDU 3	VACUUM UNIT NO. 3
4300	DD 7	DISTILLATE DESULFURIZER NO. 7
4400	PLAT 3	PLATFORMER & HYDROBON NO. 3
4600	DD 6	DISTILLATE DESULFURIZER NO. 6
5300	DD9	DISTILLATE DESULFURIZER NO. 9
5400	PLAT 4	PLATFORMER NO. 4
7300	DIM	DIMERSOL
7450	ARU 6	AMINE UNIT NO. 6
7460	ARU 7	AMINE UNIT NO. 7
3304	FL 5/7	FLARE SYSTEM (EAST)
3530	BEN ST	BENZENE STRIPPER (EAST)
4720	SWS 3	SOUR WATER STRIPPER NO. 3
4730	SWS 4	SOUR WATER STRIPPER NO. 4
4740	SRU 3	SULFUR RECOVERY UNIT NO. 3
4750	SRU 4	SULFUR RECOVERY UNIT NO. 4
4760	TGTU	TAIL GAS TREATING UNIT
7400	SWS 5	SOUR WATER STRIPPER NO. 5
7940	LHP FL	FLARES - LOW AND HIGH PRESSURE

³ §60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)

Unit Number	Abbreviation	Name
8500	COKER	COKER UNIT
8800	CNS	COKER NITROGEN SYSTEM
1900	WI	WEST INTERCONNECTS
3302	FGSE	FUEL GAS SYSTEM (EAST)
3303	H2 TI	HYDROGEN TIE-INS (EAST)
9005	BPS	BUTANE & PROPANE SYSTEM

Flare #3 receives flow from the following process units:

Table 2.4 Summary of Process Units, Ancillary Equipment, and Fuel Gas Systems Connected to the Flare #3 Header

Unit Number	Abbreviation	Name
0160	T-160 UF	UTILITY FRACTIONATOR
0200	PAR-ISOM	PAR-ISOM
1200	TRACK	TRUCK RACK
1902	WRFGS	WEST REFINERY FUEL GAS
1904	WRF	WEST REFINERY FLARE #3

A current listing of all connections, including process units, ancillary equipment, and fuel gas systems, to the Flare #8 and Flare #3 headers⁴ is included in Appendix D.

2.4 Knockout Drums

There are four knockout (KO) drums associated with Flare #8. KO drums (D-3305 and D-3352) are utilized for liquid removal from the low-pressure and high-pressure headers. The vent gas from the high- and low-pressure headers also passes through the Flare #8 Header KO Drum (D-7941). Vent gases from the Coker unit pass through a dedicated KO Drum (D-8702) and these gases converge downstream of Flare #8 Header KO Drum. The process flow diagram is provided in Appendix B. Table 2.5 summarizes the dimensions and design capacities⁵ of the KO drums associated with Flare #8.

⁴ §60.103a(a)(1), §63.670(o)(1)(i)

⁵ §60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)

Table 2.5 Flare #8 Header KO Drums

Characteristic		Low Pressure KO Drum	High Pressure KO Drum	FCC LP KO Drum	Coker KO Drum	Citation
Vessel Number		D-3305	D-3352	D-7941	D8702	§60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)
Dimensions (ft)	Outer Diameter	9 (ID)	9 (ID)	10 (ID)	10 (ID)	
	Length / Height	27 (T/T)	27 (T/T)	30 (T/T)	30 (T/T)	
Capacity (gal)		12,848	12,848	17,624	17,624	

Abbreviations:

ft – feet

ID – Inner diameter

T/T – Tangent to tangent

gal – Gallons

Flare #3 utilizes a single, horizontal KO drum (D-1129). Table 2.6 summarizes the dimensions and design capacities associated with Flare #3.

Table 2.6 Flare #3 Header KO Drum

Characteristic		Flare #3 KO Drum	Citation
Vessel Number		D-1129	§60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)
Dimensions (ft)	Outer Diameter	9 (ID)	
	Length / Height	27 (T/T)	
Capacity (gal)		12,848	

2.5 Assist System

Both flares at the refinery are steam-assisted flares.

The total steam to Flare #8 is delivered by a supply line which is operated remotely by use of two control valves in parallel (PV 4395A/B). Steam supply to the steam control valves on Stage 1 adjust remotely by operations and the control logic, while the control valves on Stages 2 through 5 open to 100% once the stage receives vent gas. Stage 6 of Flare #8 is unassisted. There are six (6) steam condensate removal traps after the steam flow meter and the condensate flow return is not metered.

Steam is delivered to Flare #3 center and ring steam manifolds by a 6-inch supply line. The flow of center steam is set at a minimum by a restriction orifice (RO; identified as flow orifice FO 407). The flow of ring steam is managed by a tiered control scheme consisting of one control valve (HV 309) and a RO (FO 310) maintains the tip manufacturer’s minimum recommended cooling steam flow rate.

Table 2.7 summarizes the total minimum and maximum steam flow rates for each flare.

Table 2.7 Steam Assist Flow Rates

Parameter	Flare	Design Total Steam Flow Rate (lb/hr)	Citation
Minimum	Flare #8	2,000	§60.103a(a)(3)(iii) §63.670(o)(1)(iii)(E)
	Flare #3, Ring	780	
	Flare #3, Center	300	
Maximum	Flare #8	112,750	§63.670(o)(1)(iii)(E)
	Flare #3, Ring	37,050	
	Flare #3, Center	300	

Abbreviation: lb/hr – pounds per hour

2.6 Pilot Gas

Both flares at the refinery are equipped with fuel gas pilot lights. There is no commercial, pipeline quality, natural gas on the island. Therefore, refinery fuel gas is used as pilot gas. Flare #8 has ten (10) pilots, while Flare #3 has three (3) pilots. Thermocouples are used on both flare tips to monitor for the presence of a pilot flame.

Table 2.8 Pilot Gas Flow Rate

Pilot Gas Flow Rate	Flare	Value (scfh)	Citation
Maximum – Total	Flare #8	500	§60.103a(a)(3)(iii)
	Flare #3	350	

Abbreviation: scfh – standard cubic feet per hour

Refinery fuel gas may also be utilized briefly for pilot ignition.

NSPS Ja explicitly allows all pilot gas lines to be exempted from sulfur content monitoring as they are considered inherently low in sulfur content⁶. Therefore, an analysis of the hydrogen sulfide (H₂S) concentration in the pilot gas is not required⁷. Additionally, pilot gas is excluded in the net heating value (NHV) and flare tip velocity calculations required by MACT CC; therefore, the pilot gas is not required to be directly monitored.⁸

2.7 Ignition System

Both flare tips include a pilot gas ignition line for each pilot, as depicted in Figure B-1 of Appendix B. Pilot gas consists of refinery fuel gas. Each flare uses high energy ignitors and flame front generator systems to light the pilots at the flare tips⁹.

⁶ §60.107a(a)(3)(i)

⁷ §60.103a(a)(3)(iv)

⁸ §63.670(o)(1)(iv)

⁹ §60.103a(a)(3)(ii), §63.670(o)(1)(iii)(G)

2.8 Flare Purge Gas

Neither flare is equipped with a continuous liquid seal; therefore, header sweep gas fulfills the purpose of purge gas for Flare #3 and Stages 1 and 6 of Flare #8. See Section 2.9 for more information regarding sweep gas.

2.9 Flare Sweep Gas

Sweep gas provides a positive pressure to reduce the ability for ambient oxygen to enter the flare header.

Flare #8 has sweep gas injection points at the following units, consisting of refinery fuel gas:

Unit Number	Location
3300	2" gate valve
3300	East Intercon, 1.5" line, no RO
3302	PCV-82
3304	FI-724 at the #5 KO Drum
3304	FI-110/ PCV-713B at the #7 KO Drum
5830	ARU #5, FI-105
7000	FCC LP Header purge, FI-1044
7300	Dimersol, FI-693
7400	#5 SWS 2" line gate valve
7600	ARU 5/6, FI-538
7904	FCC Intercon, PCV-4037

Flare #3 has sweep gas injection points at the following units, consisting of refinery fuel gas:

Unit Number	Location
1902	2" line, 1" valve, PCV-321B

Table 2.9 Sweep Gas Flow Rate

Sweep Gas Flow Rate	Flare	Value (scfh)	Citation
Minimum	Flare #8 at stage 1	1,625	60.103a(a)(3)(iii)
	Flare #3	247	

Abbreviation: scfh – standard cubic feet per hour

For flares #3 and #8, sweep gas and purge gas are the same because they do not have water seals. Higher minimum sweep gas flow rates may be needed to prevent burnback, damage to the flare tip, or other operational requirements. Also, additional sweep gas injections may be added as additional process units come online and the requirement for additional sweep gas is identified to prevent oxygen infiltration and damage to the flare tip.

Since sweep gas is injected upstream of the flow and composition monitoring equipment on both flare headers, these flows are included in the flow, total sulfur (TS), H₂S, and vent gas net heating value (NHV_{vg}) measurements.

2.10 Flare Supplemental Gas

Supplemental gas is available to each flare in order to improve the combustible characteristics of the gases reaching the flare tip. Limetree uses refinery fuel gas as supplemental gas for Flare #8 and propane for Flare #3. The supplemental gas is primarily added at the flare knock out drum or upstream in the units for each system, which are upstream of the vent gas monitoring described in Section 2.11.

Table 2.10 Supplemental Gas Flow Rate

Flare	Supplemental Gas	Maximum Value (lb/hr)	Citation
Flare #8	Fuel Gas at D-7939	5,000	60.103a(a)(3)(iii)
Flare #3	Fuel Gas at D-1129	500	63.670(o)(1)(iii)(D)

Abbreviation: scfh – standard cubic feet per hour

Flare #8 is also equipped with a John Zink Temp-Purge system to flush additional supplemental gas to the flare header and all burners following a high temperature gas release scenario. Since supplemental gas, including any temp-purge, is injected upstream of the flow and composition monitoring equipment on both flare headers, these flows are included in the flow, TS, H₂S, and NHV_{vg} measurements.

2.11 Monitoring Instrumentation

This section describes the manufacturer's specifications for each of the flow, sulfur content, and composition/NHV monitoring instruments used to demonstrate compliance with NSPS Ja¹⁰ and MACT CC¹¹.

2.11.1 Flare Vent Gas Flow

Both flares are equipped with ultrasonic flare gas flow meters that measure the volumetric flow of vent gas in the respective flare headers. The flow meters are equipped with temperature and pressure sensors to correct the flow to standard conditions and are such that they measure the total vent gas flow to the flare.

Tables 2.11 and 2.12 describe the specifications of the flow monitors and the associated temperature and pressure monitors.

¹⁰ §60.103a(a)(3)(v)

¹¹ §63.670(o)(1)(v)

Table 2.11 Flare #8 Vent Gas Flow Monitor Specifications

Characteristic	Flare #8 Flow Monitor – FIT 4013¹²	Citation
Make	GE Sensing	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	GF868	
Type	Ultrasonic, Dual Path, T17 transducers	
Range	0.1 to 328 ft/s	
Precision	±0.5% at 1 to 328 ft/s	
Accuracy	±0.04 in/s from 0.1 to 1 ft/s ±1.5% of reading above 1 ft/s	
Characteristic	Flare #8 Pressure Monitor – PDT 4035¹³	Citation
Make	Rosemount	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	3051CG	
Type	Coplanar	
Range	0 – 1,000 inches of water	
Precision	Not specified	
Accuracy	±0.04% of calibrated span	
Characteristic	Flare #8 Temperature Monitor – TT 4036¹⁴	Citation
Make	Rosemount	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	3144P	
Type	Thermocouple	
Range	0 - 500°F	
Precision	Not specified	
Accuracy	±0.02% of span	

Abbreviations:

ft/s – feet per second in/s – inches per second psig – pounds per square inch gauge
°F – degrees Fahrenheit

¹² GE Measurement & Control, DigitalFlow™ GF868, 920-009N, 2016

¹³ Rosemount 3051 Pressure Transmitter, Product Data Sheet, 00813-0100-4001 Rev TE, July 2019

¹⁴ Rosemount 3144P Temperature Transmitter, Product Data Sheet, 00813-01000-4021 Rev SB, April 2019

Table 2.12 Flare #3 Vent Gas Flow Monitor Specifications

Characteristic	Flare #3 Flow Monitor – FIT 302¹⁵	Citation
Make	GE Sensing	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	GF868	
Type	Ultrasonic, Dual Path, T17 transducers	
Range	0.1 to 328 ft/s	
Precision	±0.5% at 1 to 328 ft/s	
Accuracy	±0.04 in/s from 0.1 to 1 ft/s ±1.5% of reading above 1 ft/s	
Characteristic	Flare #3 Pressure Monitor – PIT 302¹⁶	Citation
Make	Rosemount	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	3051CG	
Type	Coplanar	
Range	0 – 1,000 inches of water	
Precision	±0.01%	
Accuracy	±0.075% of calibrated span	
Characteristic	Flare #3 Temperature Monitor – TIT 302¹⁷	Citation
Make	Rosemount	§60.103a(a)(3)(v), §63.670(o)(1)(v)
Model	3144P	
Type	Thermocouple	
Range	0 - 500°F	
Precision	Not specified	
Accuracy	±0.005%	

Each of the flow meters are maintained according to the manufacturer’s recommendations and the quality assurance procedures of Table 13 in MACT CC. Table 2.13 summarizes the calibration, quality assurance and preventative maintenance procedures for the flow meters and the associated components.

¹⁵ GE Measurement & Control, DigitalFlow™ GF868, 920-009N, 2016

¹⁶ Rosemount 3051 Pressure Transmitter, Product Data Sheet, 00813-0100-4001 Rev TE, July 2019

¹⁷ Rosemount 3144P Temperature Transmitter, Product Data Sheet, 00813-01000-4021 Rev SB, April 2019

Table 2.13 Flow Monitor - Calibration, Quality Assurance/Preventative Maintenance

CPMS	Calibration Frequency	Quality Assurance/Preventative Maintenance Procedure
Vent Gas Flow Meters	<ul style="list-style-type: none"> • Biennial flow meter calibration performed by GE Industrial Sensing personnel • Calibration after any 24-hour period where flow rate exceeded the manufacturer’s specified maximum flow rate or install a new sensor 	<ul style="list-style-type: none"> • Annual preventative maintenance performed by GE Industrial Sensing personnel • At least quarterly, inspect all components for integrity, all electrical connections for continuity, and all mechanical connections for leakage, unless the CPMS has a redundant flow sensor. • Record the results of each calibration check and inspection
Temperature Sensors	<ul style="list-style-type: none"> • Annual calibration checks • Calibration checks following any period of more than 24 hours throughout which the temperature exceeded the manufacturer's specified maximum rated temperature or install a new temperature sensor. 	<ul style="list-style-type: none"> • At least quarterly, inspect all components for integrity and all electrical connections for continuity, oxidation, and galvanic corrosion, unless the CPMS has a redundant temperature sensor. • Record the results of each calibration check and inspection.

CPMS	Calibration Frequency	Quality Assurance/Preventative Maintenance Procedure
Pressure Sensors	<ul style="list-style-type: none"> • Annual gauge and transducer calibrations using an instrument recommended by the manufacturer • Calibration checks following any period of more than 24 hours throughout which the pressure exceeded the manufacturer's specified maximum rated pressure or install a new pressure sensor. 	<ul style="list-style-type: none"> • Review pressure sensor readings at least once a week for straight line (unchanging) pressure and perform corrective action to ensure proper pressure sensor operation if blockage is indicated. • At least quarterly, inspect all components for integrity, all electrical connections for continuity, and all mechanical connections for leakage, unless the CPMS has a redundant pressure sensor. • Record the results of each calibration check and inspection

A daily check is also performed on each flow meter, temperature sensor, and pressure sensor to ensure that it is operating properly. The data acquisition and handling system (DAHS) generates an alarm if there is an issue with one of these components. In the event that a flow meter requires maintenance beyond the ability of Limetree personnel to correct, a representative from the manufacturer will be called to the site to service the flow meter.

2.11.2 Steam Flow

The flow of assist steam provided to each flare is measured by a GE GS868 ultrasonic flow meter. Each flow meter is configured such that one flow meter measures all of the steam flow. In addition, the flow meters are equipped with temperature and pressure sensors. Tables 2.14 and 2.15 document the specifications of the steam flow meters and the associated temperature and pressure monitors.

Table 2.14 Flare #8 Steam Flow Monitor Specifications

Characteristic	Flare #8 Total Steam Flow Monitor¹⁸ – FT 9540	Citation
Make	GE	§63.670(o)(1)(v)
Model	GS868	
Type	Ultrasonic	
Range	-150 to 150 ft/s	
Precision	±0.2% to 0.5% of reading	
Accuracy	±2% of reading	
Characteristic	Flare #8 Steam Pressure Monitor¹⁹ –PDT 9450	Citation
Make	Rosemount	§63.670(o)(1)(v)
Model	3051CD	
Type	Coplanar	
Range	0 – 300 psig	
Precision	0.10% of span	
Accuracy	0.25%	
Characteristic	Flare #8 Steam Temperature Monitor²⁰ – TT 9640	Citation
Make	Rosemount	§63.670(o)(1)(v)
Model	3144P	
Type	Type E	
Range	0 – 500 °F	
Precision	Not specified	
Accuracy	0.005%	

¹⁸ General Electric, DigitalFlow GS868 Datasheet, 920-006F, 2016

¹⁹ Rosemount, 3051 Pressure Transmitter Product Data Sheet, 00813-0100-4001 Rev TE, July 2019

²⁰ Rosemount, 3144P Temperature Transmitter Product Data Sheet, 00813-0100-4021 Rev SB, April 2019

Table 2.15 Flare #3 Steam Flow Monitor Specifications

Characteristic	Flare #3 Total Steam Flow Monitor²¹ – FIT 9540	Citation
Make	GE	§63.670(o)(1)(v)
Model	GS868	
Type	Ultrasonic	
Range	-150 to 150 ft/s	
Precision	±0.2% to 0.5% of reading	
Accuracy	±2% of reading	
Characteristic	Flare #3 Steam Pressure Monitor²² – PDT 9450	Citation
Make	Rosemount	§63.670(o)(1)(v)
Model	3051CD	
Type	Coplanar	
Range	0 – 300 psig	
Precision / Stability	0.10% of span	
Accuracy	0.25%	
Characteristic	Flare #3 Steam Temperature Monitor²³ – TT 9640	Citation
Make	Rosemount	§63.670(o)(1)(v)
Model	3144P	
Type	Type E	
Range	0 – 500 °F	
Precision / Stability	Not specified	
Accuracy	0.005%	

The calibration, quality assurance, and preventative maintenance procedures described for the vent gas flow meter in Section 2.11.1 and Table 2.13 also apply to the steam flow meter as both meters use the same technology. Refer to these sections for additional details on steam flow meter calibration, quality assurance and preventative maintenance.

2.11.3 Flare Vent Gas Composition

Limetree has installed an Extrel 300 MAX-RTG mass spectrometer on each flare header to demonstrate compliance with the H₂S and TS limits, as well as monitor the NHV_{vg}. The specifications of the mass spectrometers are summarized in Table 2.16.

²¹ General Electric, DigitalFlow GS868 Datasheet, 920-006F, 2016

²² Honeywell, STD800 SmartLine Differential Pressure Specification 34-ST-03-82, November 2018

²³ Rosemount, 3144P Temperature Transmitter Product Data Sheet, 00813-0100-4021 Rev SB, April 2019

Table 2.16 Mass Spectrometer Specifications

Characteristic	Mass Spectrometer	Citation
Make	Extrel Core Mass Spectrometers	§60.107a(a)(2) §60.107a(e)(1) §63.670(o)(1)(v)
Model	MAX300-RTG	
Type	Mass Spectrometer	
Vent Gas Constituent Ranges	5 ppm – 100% Hydrogen 5 ppm – 100% C1 as Methane 5 ppm – 100% C2 as Ethane 5 ppm – 100% C3 as Propane 5 ppm – 100% C4 as Butane 5 ppm – 100% C5 as Pentane and Above	
H ₂ S Span	300 ppmv H ₂ S	
Total Reduced Sulfur Span	5 ppm – 100% of combined total of COS, H ₂ S, and CS ₂	
Precision	+/- 0.05% relative standard deviation	
Accuracy	+/- 0.05% relative standard deviation	

Under a requested Alternative Monitoring Plan (AMP) submitted to the U.S. EPA on August 30, 2019, the mass spectrometer is subject to alternative quality assurance/quality control (QA/QC) requirements relating to the daily calibration drift checks and the quarterly accuracy requirements for the sulfur compounds. The AMP approval is included as Appendix E. A copy of the broadly applicable AMP which allows for the use of mass spectrometers for compliance with MACT CC is included as Appendix F. A copy of the broadly applicable AMP which covers the daily QA/QC and performance audit requirements for the NHV reported by the mass spectrometers is included as Appendix G.

Limetree calibrates, maintains, and performs quality assurance on the mass spectrometers according to the manufacturer’s recommendations, Table 13 of MACT CC, and Appendices B and F referenced in NSPS Ja.

Table 2.17 Mass Spectrometer Calibration, Quality Assurance/ Preventative Maintenance

CPMS	Calibration Frequency	Preventative Maintenance Procedure
Vent Gas Composition Analyzer – NHV	<ul style="list-style-type: none"> • Daily validations and quarterly calibration validations conducted according to the requirements of broadly applicable AMP included in Appendix G • Quarterly multi-point, triplicate injection calibration validation for NHV • Quarterly performance audit at mid-level (injected at probe) • Calibration following corrective action after failing an initial multipoint calibration or daily validation 	<ul style="list-style-type: none"> • Maintenance schedule according to manufacturer’s recommendations
Vent Gas Composition Analyzer – H ₂ S and TRS	<ul style="list-style-type: none"> • Daily low and high-level draft checks at the H₂S and TRS spans provided in the AMP approval included in Appendix E • Quarterly cylinder gas audits (CGAs) at the H₂S and TRS spans provided in the AMP approval included in Appendix E in 3 out of 4 quarters • Annual relative accuracy test audit (RATA) or alternative RATA at the H₂S and TRS spans provided in the AMP approval included in Appendix E in the quarter where a CGA is not performed 	

The daily analyzer validations indicate whether the system is responding properly. The DAHS generates an alarm if a mass spectrometer fails a daily or quarterly validation. If this occurs, Limetree will attempt repairs or recalibration to determine if the analyzer can pass the validation. In the event Limetree personnel cannot repair the analyzer, a representative from the manufacturer will be called to the site to service the analyzer.

SECTION 3

FLARE MINIMIZATION

3.1 Description of Contributions to Flare Header

As listed in Section 2.3, the contributions to the flare headers derive from refinery process units, ancillary equipment, and fuel gas systems and consist of pressure relief devices (PRDs), control valves, manual bypasses, manual valves, sample points, sweep vents, analyzer vents, and pump and compressor seal connections. The minimization assessment included reductions of the volume of process gas to the flares through process operating changes as described below. Because Limetree has never operated the refinery, the minimization assessment was performed as part of the design of the reconfigured refinery.

3.2 At Source Minimization Assessment

As part of its minimization assessment, Limetree identified opportunities to eliminate process gas discharges to the flares through process operating changes and gas recovery, and through reductions of the volume of process gas through process operating changes. Capturing and recovering process gases to the refinery fuel gas system where they can be used as fuel in refinery fired sources, e.g., heaters, boilers, and turbines is uniquely important to the Limetree refinery because St. Croix does not have access to natural gas like Gulf Coast and other US refineries. Accordingly, Limetree has replaced or upgraded PRDs, including PSVs, from hard seats to soft seats, reviewed set points and developed monitoring of process parameters to minimize the risk of a release. Additionally, certain manual bypass valves that are in parallel with PSVs and control valves have been upgraded to Tight Shut Off (TSO) valves to minimize leakage through the bypass. For certain sample points, Limetree has redirected the sample return to the inlet of the vessel instead of the flare header. Pump seal vents are monitored for pressure increases to detect pump seal failure, allowing the redundant pump to be put into service and the malfunctioning pump to be removed from service quickly. The pump seals are also visually inspected. Startup and shutdown operating procedures have been updated, along with procedures for preventative maintenance. Certain process gas streams were blinded or removed from the flare header and re-routed to the fuel gas system. Each of these changes has been completed.

Limetree spent in excess of \$1 million in capital on the minimization measures described above. There will not be annual operating costs but there may be additional capital to upgrade, repair, or replace valves and devices over time. Natural gas offset credits are not applicable and no secondary environmental impacts were identified. Each change was technically feasible and safety concerns were either addressed or not identified.

As listed in Appendix D, the following connections to the flares have been assessed:

Flare #3 64 total connections including 44 PRDs

Flare #8 799 total connections including 363 PRDs

The following subsections describe the refinery's assessment of whether these connections and potential discharges to the flares from process units, ancillary equipment and fuel gas systems can be minimized. Each subsection discusses the assessment of minimization alternatives, and all minimization alternatives have been implemented by the due date of the FMP. The Limetree Bay Refinery also assessed the extent to which flow could be minimized or prevented during periods of startup, shutdown, or emergency releases.²⁴

The existing connections to Flare # 8 and Flare #3, were reviewed as part of the minimization assessment to identify opportunities to remove streams from the flares. Using this process, Limetree has ensured that the details regarding the contribution profile for each connection was methodically assessed and minimization strategies were identified based on the assessment.

3.2.1 Pressure Relief Devices

PRDs are relief devices used to release unplanned, nonroutine discharges in order to avoid safety hazards or equipment damage. PRDs include pressure safety valves (PSVs) used to maintain safe operating pressures in the process units. A list of the PRDs that vent to each flare (which includes the type, diameter, and set pressure of each PRD, in addition to a listing of implemented prevention measures) is maintained at the Limetree Bay refinery²⁵.

The minimization assessment included flaring related to emergency releases²⁶. The magnitude of flaring events during emergencies depends on the severity of the event and the units involved. Lifting a PRD is an undesirable emergency condition, and refinery personnel strive to prevent emergency events from occurring through the operation of refinery process units in accordance with the operating procedures and process unit design. Therefore, operator actions minimize emergency releases to the maximum extent possible.

As part of the minimization assessment, Limetree reviewed the list of PRDs to determine which gas streams have potentially high H₂S and/or sulfur concentrations. The PRDs whose lifting results in high sulfur gas vented to the flare headers have been upgraded from traditional PSVs to soft seat PSVs. Soft seat PSVs have lower leakage rates compared to traditional PSVs. Therefore, the flow of vent gas and sulfur compounds by PSV leakage to flare has been minimized by upgrading and replacing conventional PSVs with soft seat PSVs. Limetree's assessment has resulted in the upgrade of 169 PSVs in Flare #8 system (over 46% of the 363 PSVs) to the new soft seats. In addition, 26 PSVs locations have been modified to include new rupture disks below the PSV, further minimizing the potential for leakage.

Limetree reviewed PRDs connected to each flare header and identified prevention measures associated with each PRD²⁷. One of the prevention measures adopted at the Limetree Bay

²⁴ §63.670(o)(1)(ii)

²⁵ §63.670(o)(1)(vi)

²⁶ §63.670(o)(1)(ii)

²⁷ §63.670(o)(1)(ii)(B)

refinery is a preventative maintenance which requires each PRD to be periodically inspected and removed to ensure proper operation of the PRD. PRD preventative maintenance minimizes flaring by ensuring the proper operation (including preventing leaks and ensuring proper reseating following a relief event) of the individual PRDs.

Operational parameters (such as temperature, pressure, and level monitoring) are monitored on upstream equipment protected by PRDs as part of normal operations at the refinery. During normal operations, operators monitor the parameters for changes which may indicate conditions within the process unit that could result in a PRD relieving to a flare. Monitoring these parameters allows operators to take early corrective action prior to a PRD relieving, thus preventing flaring events. After a PRD relieves, operations personnel continue to monitor the various operating parameters to ensure that the PRD re-seats properly. These preventative maintenance and operational observations are used to minimize contributions to the flare header.

As a result of Limetree's minimization actions, each PRD is equipped with at least one prevention measure.

3.2.2 Control Valves

Control valves relieve gases to the flare headers based on a process pressure set point. These set points have been established to open a control valve at a lower pressure than that which would cause a PRD to relieve, such that a process upset may be managed in a more controlled fashion (i.e., staged relief system). Releases to the flares from control valves are minimized to the extent possible through optimizing pressure and process set points.

Control valves that are in high sulfur service were also assessed similar to the PSVs discussed in Section 3.2.1. For those valves which could result in high sulfur gas leaking by the valve seat, Limetree has upgraded the control valves from traditional control valves to new, low leakage, Tight Shut Off (TSO) valves. The TSO valves have lower leak rates than conventional control valves; therefore, the contributions of control valve leakage have been minimized during periods when the valve is not opened by the control system. Over 242 new TSO valves (automatic and manual) have been installed onto Flare #8 system. Control valves tied in to Flare #3 have not been upgraded to TSO valves to date as they are not in high sulfur service.

3.2.3 Manual Bypass Valves

Manual bypass valves divert flow around either PRDs or control valves and are typically used only during maintenance, startup, and shutdown (MSS) activities. NSPS Ja allows for contributions from MSS activities to be minimized through the use of written procedures which are designed to minimize flaring²⁸. Similarly, the minimization assessment required for MACT CC requires Limetree to consider modifications to the startup and shutdown procedures to reduce

²⁸ §60.103a(a)(5)²⁹ §63.670(o)(1)(ii)(A)

the quantity of gas sent to each flare²⁹. Refer to Section 3.3 for a discussion of startup and shutdown procedures.

PRDs at the refinery are periodically removed for maintenance. When there is maintenance performed on PRDs or control valves or during startup and shutdown activities, the manual bypass valves around these PRDs are used, as necessary, to control the pressure in the system and minimize flaring. Manual bypasses typically are used only when purging vessels during a shutdown and/or maintenance activity.

3.2.4 Sweep Gas

The refinery utilizes monitoring and operator verification to ensure that sweep gas flows remain set at the flow rate required to prevent air infiltration into the flare headers and ensure safe flare practices. Due to the large number of process units connected to Flare #8, as well as the large pipe diameters and flare header distances, there is a commensurate number of sweep gas injection points. There are currently eleven (11) sweep gas injection points for Flare #8 and one (1) for Flare #3. Therefore, the sweep gas flow rates could not be further minimized.

3.2.5 Sample Points

Sample stations are connected to the flare header to allow the sample lines to be purged prior to obtaining a sample to ensure that a representative sample is collected. Generally, the sample line associated with each sample station consists of piping or tubing less than one inch in diameter. Because the sample stations are located in close proximity to the process vessel to be sampled, the volume of gas required to be purged prior to sampling has been minimized to the extent possible by the location and design of the sample point.

As part of the minimization assessment, Limetree identified in-line sampling systems on the outlets of vessels that vented to the flare. These samples are expected to have high concentrations of sulfur. To minimize these contributions to the flare, Limetree has redirected the sample return to the inlet of the vessel instead of to the flare header.

3.2.6 Pump Seal Vents

Pump seal vents are open to the flare and monitored for pressure increases which indicate when a seal has malfunctioned and requires maintenance. Flow to the flare is only expected to occur as a result of seal failure. Pump seals are checked frequently, generally during operator rounds throughout each day, to ensure that the seal has not malfunctioned. The pressure monitoring allows for the prompt identification of a pump seal failure, which also allows the redundant pump to be put into service and the malfunctioning pump to be removed from service and scheduled for maintenance. This pressure monitoring therefore minimizes the contributions to the header from these sources.

²⁹ §63.670(o)(1)(ii)(A)

3.2.7 Manual Valves

Manual valves connected to the flare headers are utilized for maintenance, emergency relief, or on an intermittent basis. These connections to the flare are required to maintain process safety and integrity of the equipment. As a result of the detailed connection survey, many manual valves have been blinded and disconnected from historical equipment to further minimize any unintended use.

3.2.8 Diversion of Vent Gas to Fuel Gas System

As part of the minimization assessment, Limetree assessed alternative locations to which certain gaseous streams could be re-directed instead of the flares. Limetree Bay redirected numerous streams from the flares to the fuel gas systems. For example, Limetree re-routed a low pressure, yet potentially high sulfur, gas stream at the Utility Fractionation unit going to the Flare #3 header and directed it instead to the low-pressure sour gas collection system and the GRU #2 LP Amine Contactor. The low pressure treated off-gas from this contactor can then be combined with potential PSA tail gas (from the new pressure swing absorber unit) which collectively can be increased in pressure using newly refurbished compressors (C-4850) and blended into the overall fuel gas system. Limetree estimates that the diversion of the potentially high sulfur streams from Flare #3 header to the fuel gas system will result in a reduction in vent gas flow of 5,000 standard cubic feet per hour (scfh) to Flare #3.

3.3 Minimization Through Startup and Shutdown Procedures

Limetree has reviewed and updated its operating procedures for planned shutdowns and startups of process units and ancillary equipment.

The procedures describe the specific steps to be taken by operators to perform a shutdown and startup in a planned, step-wise manner, to minimize flaring while taking both operational requirements and safety precautions into consideration. Procedures to minimize flaring during startup and shutdown are identified in Appendix H.

3.4 Minimization During Periods of Fuel Gas Imbalance

Fuel gas and purchased propane are used as the fuel source for the fired sources and the electrical cogeneration systems at the Limetree Bay refinery. If fuel gas production exceeds the demand of the fired sources and cogeneration system, the excess fuel gas is sent to the flare as there are no additional fuel gas consumers at the facility. The cogeneration system at the Limetree Bay refinery is discussed in more detail in Section 3.6.

Limetree's procedures for reducing flaring in cases of fuel gas imbalance (i.e., excess fuel gas for the refinery's energy needs) are identified in Appendix I.

3.5 FGR Assessment

Facilities with flares subject to NSPS Ja and MACT CC are required to consider and evaluate the feasibility of installing a Flare Gas Recovery (FGR) system as part of the minimization assessment³⁰.

Using the estimated normal operations baseline flow rate discussed below in Section 3.7 and the average price of propane as delivered to St. Croix (\$18.62 per thousand cubic feet [Mcf]), the payback period for installation of an individual FGR system for each flare was estimated. For example, Flare #3 is expected to have a primary baseline flow of 306,000 scfd, which over 365 days is approximately 91,250 Mscf/yr. However, a higher baseline flow may be needed to prevent burnback and damage to the flare tip. The primary baseline will be reviewed after refinery restart and the FMP will be updated if needed. The FGR cost estimate for Flare #3 is \$15 million. An FGR cost estimate for Flare #8 including new vessels and compressors is \$35 million. A combined FGR system for both flares was not considered due to the large physical distance between the two flare headers and because interconnected piping is not already in place. These cost estimates are not based upon any formal engineering design or detailed costing exercise. Table 3.1 outlines the basic assumptions made for this assessment. Based on this assessment, using the current price of propane as delivered to the island and the total amount of baseline flared gas as the only factors, installation of an FGR system is not economically feasible for either flare at this time.

Table 3.1 FGR Assessment

Flare	Propane Price (\$/Mscf)	Annual Volumetric Flow (Mscf/yr)	Estimated Annual Value Lost to Flare ³¹	Approximate Payback Period ³²
Flare #8	\$18.62	182,625	\$3,400,477	10.29 years
Flare #3	\$18.62	111,766	\$2,081,092	7.21 years

Abbreviations: \$/Mcf – dollars per thousand cubic feet Mscf – thousand standard cubic feet

The costs described in the table above do not include other factors that are likely to make the costs even higher including location, sizing, the quality of gas to be recovered, associated utilities required for compressor operation, and the refinery turnaround schedule.

³⁰ §60.103a(a)(2)(iii), §63.670(o)(1)(ii)(C)

³¹ Estimated Annual Value Lost to Flare assumes no other minimization activities and no refinery expansions which may increase flow to the flare.

$$\text{Est. Annual Value to Flare} = \text{Propane delivered to St. Croix} \left(\frac{\$18.62}{\text{Mscf}} \right) \times \text{Annual Volumetric Flow} \left(\frac{\text{Mscf}}{\text{yr}} \right)$$

³² Payback period for Flare #8 assumes a cost of \$35 million per FGR system and constant propane prices.

$$\text{Payback Period} = \frac{\$35,000,000}{\$3,400,477 \text{ Estimated Annual Value Lost to Flare}}$$

3.6 Cogeneration Assessment

NSPS Ja and MACT CC require an assessment of the potential installation of a cogeneration system for refineries that are fuel gas long³³. The refinery has an existing cogeneration unit with a capacity of 125 megawatts (MW). The cogeneration unit was designed to service the electrical needs of the entire refinery and therefore is oversized for the current operation of the refinery with a portion of the process units running. Limetree expects the normal average electricity demand to be approximately 72 megawatt-hours (Mwh) to run the process units within the refinery. Local requirements and regulations prohibit Limetree's ability to transfer, transmit, or sell any excess electricity generated at the site into the local residential power grid for the remainder of the island; therefore, it is not feasible to utilize excess fuel gas to generate any additional electricity from the cogeneration unit beyond what the refinery demands.

3.7 Baseline Flow Evaluation

NSPS Ja³⁴ specifies that a baseline flow evaluation must be conducted after implementation of the selected minimization opportunities identified during the minimization assessment. The determination of the baseline flow is not required to include pilot gas or purge gas, provided that these flow rates remain relatively constant. The baseline flow rate does include sweep gas injections at continuous flares. The baseline flow rate also includes anticipated relief device and compressor/pump seal leakages as well as routine and period maintenance activities. The baseline flow rate also includes most periods of normal planned small-equipment start-up and shut-down. Major process unit shutdowns, startups, and fuel gas imbalance events as well as emergency events and malfunctions naturally could exceed the baseline flow rate. The baseline flow is the flow that the minimization assessment determined could not be further minimized.

Limetree has concluded its minimization assessment and has selected a variety of engineering solutions to implement within the newly reconfigured process units as well as changes and improvement within both flare systems. In addition to the new equipment upgrades and waste gas stream isolation techniques detailed above, Limetree is also installing secondary H₂S controls on each flare system (i.e.: H₂S scavenger) to periodically abate potential flare gas in excess of the regulatory limits of H₂S; however this does not materially affect the baseline flow rates of each flare. With the improvements to the process and flare systems as envisioned, Limetree anticipates normal operational flow rates to the two flares to be significantly lower than historical flow rates.

These baseline flows have not been measured and cannot be formally modeled with accuracy today because there is no current operational data upon which to base any new flow rates. A revised baseline flow to the flares may be re-submitted if warranted.

³³ §60.103a(a)(2)(iii), §63.670(o)(1)(ii)(C)

³⁴ §60.103a(a)(4)

3.7.1 Normal Operations Baseline

Limetree personnel have performed engineering calculations to estimate the anticipated baseline flow rate to each flare. This estimate takes into account the potential amount of sweep gas and supplemental gas believed to be required to maintain 270 Btu/scf in the combustion zone. The baseline flow rate also includes anticipated relief device and compressor/pump seal leakages as well as routine and periodic maintenance activities. The baseline flow rate also includes most periods of normal planned small-equipment start-up and shut-down. The baseline flow rates and thresholds for an RCA³⁵ and corrective action analysis for each flare under periods of normal operation are summarized in the table below.

Table 3.2 Baseline Flow Rates and RCA Thresholds for Normal Operations

Flare	Baseline Flow Rate (scf/24-hour period)	RCA Threshold (scf/24-hour period)
Flare #8	500,000	1,000,000
Flare #3	306,000	806,000

3.7.2 Alternative Baseline – Platformer Startup

During periods of restart commissioning, and process unit startup, Limetree will not be able to recover some of the hydrogen gas streams which typically are used internally or recycled to the fuel gas system because the composition of these streams may not be suitable for use or combustion in the refinery’s fired sources until the process units are properly operating at normal conditions. The Platformer #4 unit will commence operation before all the units are restarted during the refinery restart and the downstream consumers of its hydrogen production may not be able to immediately utilize the hydrogen. The hydrogen stream will contain some hydrocarbons as well, and must be flared if not otherwise consumed. The Platformer #4 will be operated at low feed rates to minimize flaring; however, a high hydrogen stream may be flared in significant quantities during process unit startup since the fuel gas systems and cogeneration systems cannot accommodate this high hydrogen case. These flow rates may be in excess of 1,000,000 scfh. As a result, the quantity of gas anticipated to be flared at Flare #8 may be significantly larger than the normal operations baseline. There may be more than one major Platformer #4 startup event per year and these events may last for periods of 1 to 6 days. The minimization procedures discussed in Section 3.3 will be followed to ensure the quantity of gas is minimized during these startups.

The alternative baseline flow rate and threshold for an RCA³⁶ and corrective action analysis are summarized in the table below.

³⁵ §60.103a(c)(1)(ii)

³⁶ §60.103a(c)(1)(ii)

Table 3.3 Alternative Baseline for Platformer Startup

Flare	Baseline Flow Rate (scf/24-hour period)	RCA Threshold (scf/24-hour period)
Flare #8	30,000,000	30,500,000

APPENDIX A
CROSS REFERENCE TABLES

**Table A-1
Regulatory Cross-Reference Table**

Regulatory Citation		Description	FMP Section
NSPS Ja	MACT CC		
60.103a(a)(1)	63.670(o)(1)(i)	List of Process Units	2.3, Tables 2.3 & 2.4
		List of Ancillary Equipment	2.3, Tables 2.3 & 2.4
		List of Fuel Gas Systems	2.3, Tables 2.3 & 2.4
60.103a(a)(2)	63.670(o)(1)(ii)	Minimization Assessment	3.2, 3.3, 3.4, 3.5, and 3.6
60.103a(a)(3)(i)(A-G)	63.670(o)(1)(iii)(A)	Flare Type (Ground or Elevated)	2.1, Table 2.1
		Assist System Type (Steam, Air, Pressure, Non-Assisted, etc.)	2.1, 2.5, Table 2.1
	---	Flare tip type (Simple, Staged, Sequential, etc.)	2.1, Table 2.1
	---	Cascaded Flare System	2.1, Table 2.1
	---	Backup Flare System	2.1, Table 2.1
	63.670(o)(1)(iii)(A)	Description of Flare Usage (Emergency/Non-emergency, Routine, SU/SD)	2.1, Table 2.1
		Flare Gas Recovery System	N/A
---	63.670(o)(1)(iii)(B)	Smokeless Capacity Based on Design Conditions	2.1, Table 2.1
60.103a(a)(3)(ii)	63.670(o)(1)(iii)(G)	Flare Tip Description and Design Parameters	2.2, Appendix C
		KO Drum	2.4, Appendix B
		Flare Header and Subheaders	2.3, Appendix B
		Assist System	2.5, Appendix B
		Ignition System	2.7, Appendix B
60.103a(a)(3)(iii)	63.670(o)(1)(iii)(C)	Maximum Vent Gas Flow Rate	2.1, Table 2.1
	---	Minimum Sweep Gas Flow Rate	2.9, Table 2.9
	---	Minimum Purge Gas Flow Rate	N/A
	63.670(o)(1)(iii)(D)	Maximum Supplemental Gas Flow Rate	2.10, Table 2.10
	---	Maximum Pilot Gas Flow Rate	2.6, Table 2.8
	63.670(o)(1)(iii)(E)	Minimum Steam Flow Rate	2.5, Table 2.7
---	---	Maximum Steam Flow Rate	2.5, Table 2.7
---	63.670(o)(1)(iii)(F)	Assist Air System Details (if applicable)	N/A
60.103a(a)(3)(iv-v)	63.670(o)(1)(iv-v)	Flare Header	2.11, Appendix B
		Purge Gas	N/A
		Sweep Gas	2.9, Appendix B
		Supplemental Gas	2.10, Appendix B
		Pilot Gas	2.6, Appendix B
		Manufacturer's specifications for each monitor/analyzer identified in 60.103a(a)(3)(iv) and 63.670(o)(1)(iv)	2.11
60.103a(a)(3)(vi)	---	Water Seal	N/A
60.103a(a)(3)(vi)	---	Elected Monitoring Option (Flow and Sulfur Monitoring or Flare Header Pressure and Water Seal Liquid Level Monitoring)	N/A
60.103a(a)(3)(vii)	---	Description of FGRU, FGRU monitoring parameters, and compressor system logistics	N/A
60.103a(a)(4)	---	Baseline flow evaluation	3.7
---	63.670(o)(1)(vi)	Pressure Relief Device Descriptions (Type, Diameter, Set Pressure, and Any Prevention Measures)	Appendix D
60.103a(a)(5)	63.670(o)(1)(vii)	Procedures to minimize or eliminate discharges during planned shutdown and startup	3.3
60.103a(a)(6)	---	Procedures to reduce flaring in cases of fuel gas imbalance	3.4
60.103a(a)(7)	---	Procedures to minimize frequency and duration during FGRU outages and to minimize flaring during FGRU outages	N/A
60.103a(b)(1-2)	63.670(o)(2)	Submission requirements for initial FMP and events which trigger re-submittal of the FMP	1.4

APPENDIX B
PROCESS FLOW DIAGRAM

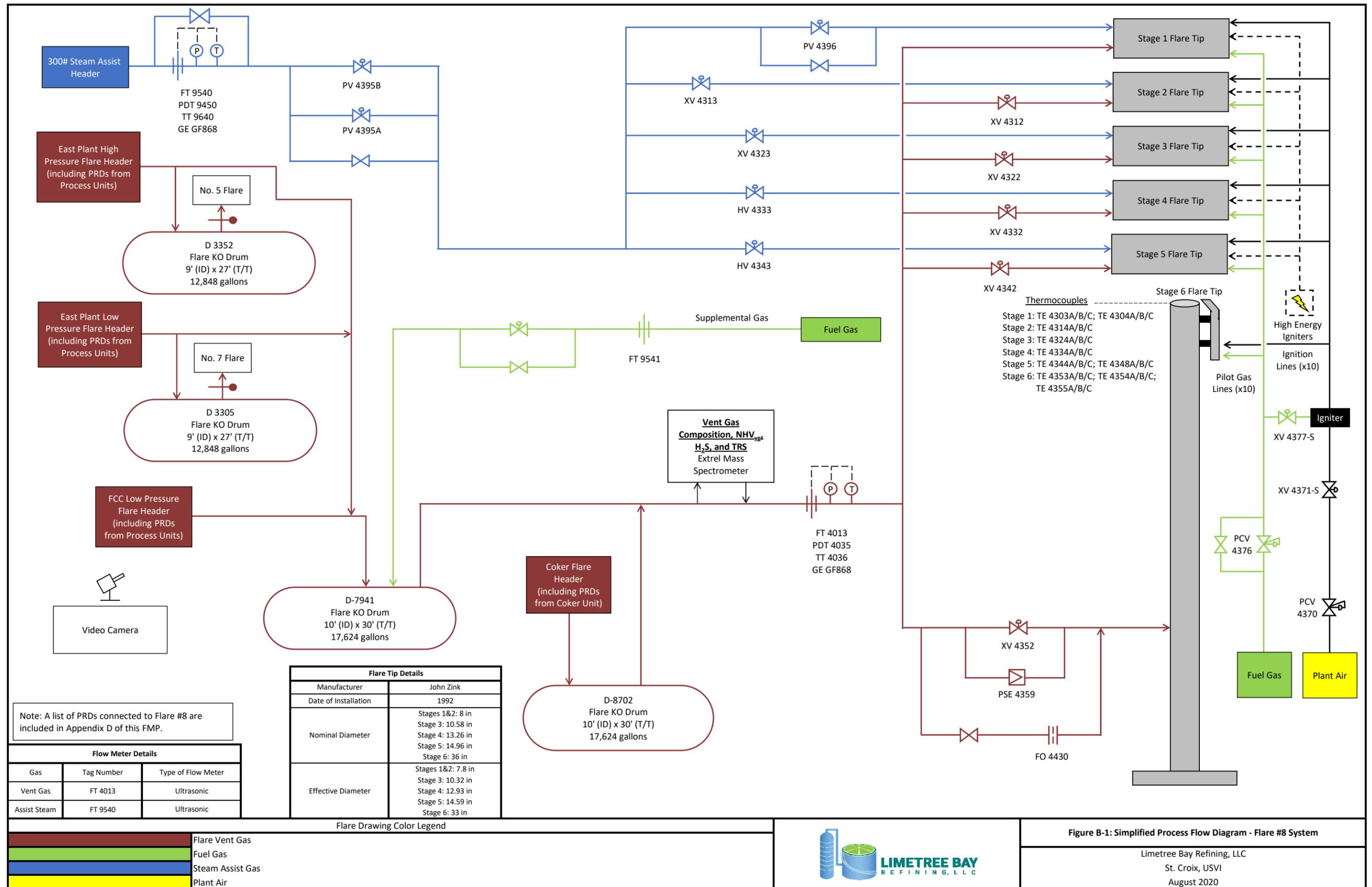


Figure B-1: Simplified Process Flow Diagram - Flare #8 System

Limetree Bay Refining, LLC
St. Croix, USVI
August 2020

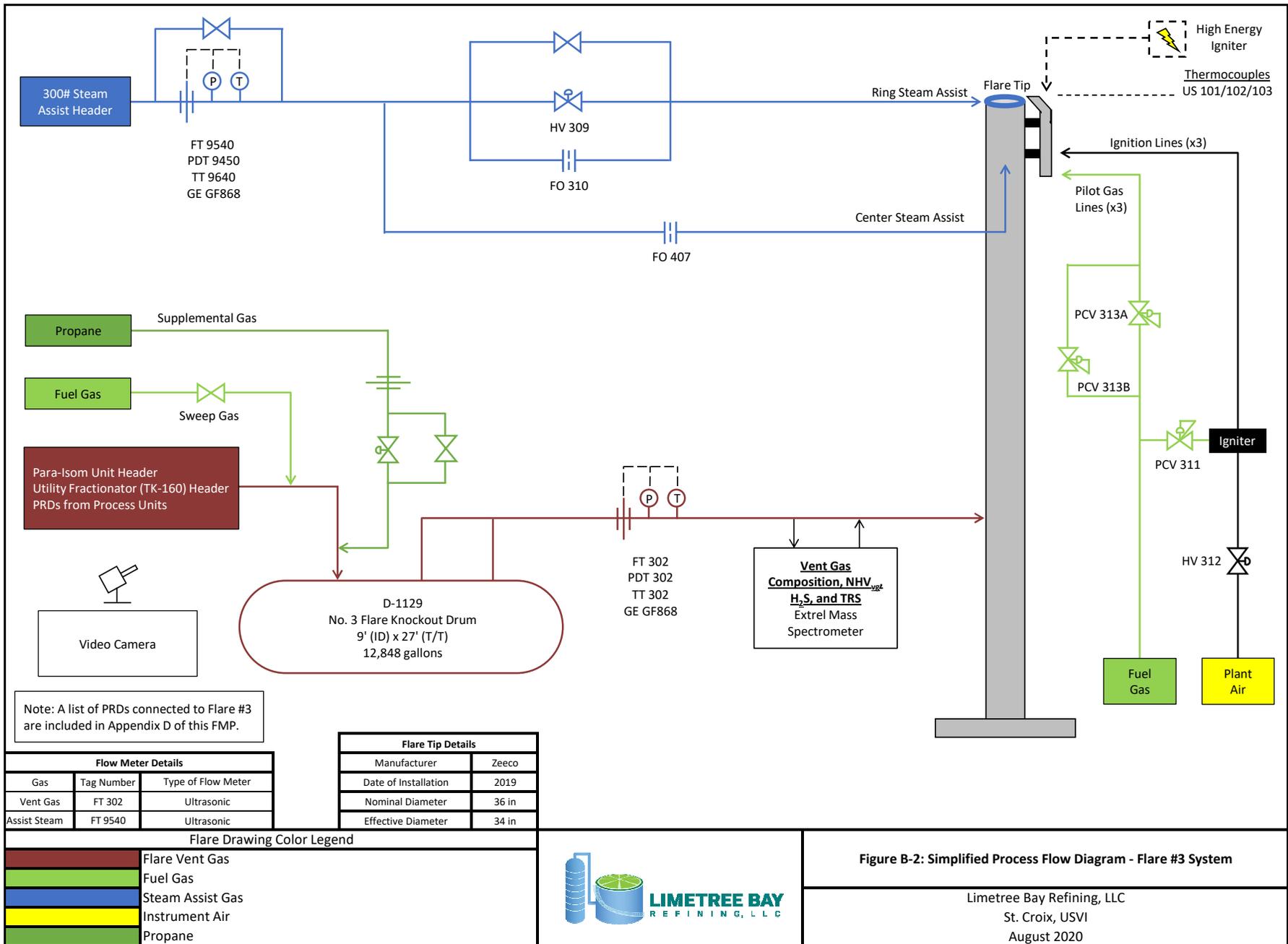


Figure B-2: Simplified Process Flow Diagram - Flare #3 System

Limetree Bay Refining, LLC
 St. Croix, USVI
 August 2020



APPENDIX C FLARE TIP DRAWING

The flare tip drawing is not included in this Flare Management Plan; however, it is available at the site upon request.

APPENDIX D
FLARE CONNECTION LIST

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	0200	Penex	0002	4	7	C-200A Penex Recycle Gas Compr Disch PSV-85 bypass	MO	3		1	gate
1	0200	Penex	0002	4	8	C-200A Unifining Recycle Compr. Disch. PSV-94 bypass	MO	3		1	gate
1	0200	Penex	0002	4	9	C-200A Make-up Gas Compressor Disch PSV-101 bypass	MO	3		1	gate
1	0200	Penex	0002	5	21	C-200B Penex Recycle Gas Compr Disch PSV bypass	MO	3		1	gate
1	0200	Penex	0002	5	22	C-200B Unifining Recycle Compr. Disch. PSV bypass	MO	3		1	gate
1	0200	Penex	0002	5	23	C-200B Make-up Gas Compressor Disch PSV bypass	MO	3		1	gate
1	0200	Penex	0002	6	31	C-200C Penex Recycle Gas Compr Disch PSV bypass	MO	3		1	gate
1	0200	Penex	0002	6	32	C-200C Unifining Recycle Compr. Disch. PSV bypass	MO	3		1	gate
1	0200	Penex	0002	6	33	C-200C Make-up Gas Compressor Disch PSV bypass	MO	3		1	gate
1	0200	Penex	0002	7	44	D-279 Regenerate Surge Drum Off Gas via PV-185B	AO	3	PV-185B	1	
1	0200	Penex	0002	10	60	T-276 Stab. Gas Scrubber Off Gas via PV-242	AO		PV-242	2	
1	0200	Penex	0002	10	61	T-276 Stabilizer Gas Scrubber PSV bypass	MO	3		1	gate
1	0200	Penex	0002	10	62	D-288 Auxiliary Stabilizer Gas Scrubber PSV bypass	MO	3		1	gate
1	0200	Penex	0002	1B	68	D-275 Feed Surge Drum Off Gas via PV-12B	A	3	PV-12B	1	
1	0200	Penex	0003	4	80	D-203 Stripper Receiver Vent	MM	3		1.5	gate
1	0200	Penex	0004	1	84	D-277 Hot Oil Surge Drum Off Gas via PV-349B	AO		PV-349B	1	
1	0200	Penex	0006	2	87	D-215 Fuel Gas Balance Drum Drain	MO	3		2	gate
1	0200	Penex	0010	1	91	D-295 Dry Drum Inlet bypass	O	3		2	gate
1	1651	Gas/LPG Load.	0002	1	1	P-1227 Truck Loading Pump Seal Pot Vent	MO	3		1	gate
1	1900	W Interconn.	0003	14	1	D-206 Gas Scrubber Off Gas	MO			6	gate
1	1900	W Interconn.	0003	14	2	D-206 Gas Scrubber Drain	MO	2		1.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	1900	W Interconn.	0003	19	4	P-154 A/C LPG Transfer Pump Seal Pots	O	3		1	gate
1	1900	W Interconn.	0003	19	5	P-154 B LPG Transfer Pump Seal Pot	O	3		1	gate
1	1902	W FG Syst.	0002	3	10	D-1110 Fuel Gas Balance Drum Drain	MO	3		2	gate
1	1902	W FG Syst.	0002	3	11	East / West Fuel Gas Transfer Line to West Refinery via D-1110 Fuel Gas	AO	3		6	gate
1	1902	W FG Syst.	0002	3	12	C3 Vapor Ex Tks to FCCU Fuel Gas Import Line to west Refinery via D-1110 Fuel Gas	AO	3		6	gate
1	1902	W FG Syst.	0002	3	13	D-1110 Fuel Gas Bal Drum Off Gas to E/W FG Transfer Line	MO	3		8	gate
1	9005	C4 & C3 Syst	0003	1	1	Power House No. 1 Propane Vaporizer Vent	MO	3		2	gate
3	3100	#5CDU	0005	4	1	D-3101A Desalter Vent	MM	7		2	gate
3	3100	#5CDU	0005	5	2	D-3101B Desalter Vent	MM	7		2	gate
3	3100	#5CDU	0005	6	3	D-3105 Desalter Water Make-up Vent	O	7		3	gate
3	3100	#5CDU	0005	22	14	C-3101 Gas Rcvr.. Comp Discharge PSV bypass	MO	7		1	gate
3	3100	#5CDU	0005	24	20	D-3104 Light Naphtha OVHD Rcvr. via PCV 420B	AO	7	PCV-420B	1	
3	3202	DeiC5/iC5	0004	2	2	D-3201 Deisopentanizer Ovhd Rcvr PSV bypass	MM	7		3	globe
3	3202	DeiC5/iC5	0004	4	8	D-3208 Sand Filter PSV bypass	MM	7		2	gate
3	3203	Caustic Unit	0004	1	1	TK-3203 Spent Caustic Tank Off Gas	O	7		2	gate
3	3203	Caustic Unit	0004	1	2	D-3211 Skim Pot Off Gas	O	7		2	gate
3	3203	Caustic Unit	0004	1	3	D-3209 Caustic Injection Day Tank Off Gas	O	7		2	gate
3	3203	Caustic Unit	0004	2	4	TK-3201 10 Be' Caustic Storage Mix Tank Off Gas	O	7		2	gate
3	3302	E. FG Syst.	0003	1	1	D-3354 FG Balance Drum Main Off Gas	MO			16	gate
3	3302	E. FG Syst.	0003	1	2	D-3307 FG Balance Drum Main Off Gas	MO			12	gate
3	3302	E. FG Syst.	0003	1	3	D-3307 Fuel Gas KO Drum via PCV-656	AO	7	PCV-656	3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	3302	E. FG Syst.	0003	1	4	D-3354 FG Balance Drum Drain	MO	7		2	gate
3	3302	E. FG Syst.	0003	1	5	D-3307 Fuel Gas KO Drum Drain	MO	7		2	gate
3	3302	E. FG Syst.	0003	2	12	E-3310 LPG Vaporizer No. 7 LPG Gas via PV-655B	AO		PV-655B	3	
3	3302	E. FG Syst.	0003	2	13	E-3301 LPG Vaporizer No. 6 LPG Gas via PV-655A	AO		PV-655A	3	
3	3302	E. FG Syst.	0003	3	16	E-7935 No. 9 Vaporizer C3 Gas via FV-735	AO		FV-735	1	
3	3302	E. FG Syst.	0003	3	17	E-7935 No. 9 Vaporizer C3 Gas via PV-655C	AO		PV-655C	6	
3	3302	E. FG Syst.	0003	6	21	Blanket Gas Control Station Drain	MO	6		1	gate
3	3302	E. FG Syst.	0003	10	28	Line No. 1069 FG via PCV-034	MO	7	PCV-034	1	
3	4100	#6CDU	0005	6	3	D-4105 Desalter Water Make-up Drum	MO	7		3	gate
3	4100	#6CDU	0005	21	20	C-4101A Gas Recovery Comp. Discharge PSV bypass	MM	7		1	gate
3	4100	#6CDU	0005	22	23	T-4108 Stab Feed Contactor Off Gas via PV-376B	AO	7	PV-376B	3	
3	4100	#6CDU	0005	24	31	D-4104 Lt. Naph Stab Ovhd Rec'r Off Gas via PV-420B	AO	7	PV-420B	1	
3	4100	#6CDU	0005	26	37	D-4111 Lt. Naphtha Fractionator OVHD Rec. PSV bypass	MM	7		3	globe
3	4810	Disul Oil Rec.	0002	1	1	D-4815 Disulfide Storage Off Gas	O	7		6	gate
3	4810	Disul Oil Rec.	0002	2	4	D-4814 Disulfide Separator / Storage Off Gas	O	7		6	gate
3	4810	Disul Oil Rec.	0002	3	7	D-4819 Merox Vent KO Drum PSV bypass	MM	7		3	gate
3	4810	Lean oil Abs.	0004	2	12	T-4811 Absorber Tower Off Gas	MO			10	gate
3	4810	Lean oil Abs.	0004	2	14	T-4811 PSV Bypass	MM	7		1.5	gate
3	4820	#2 LPG Treater	0002	1	1	T-4824 Amine Contactor PSV bypass	MM	5		1.5	gate
3	4820	#2 LPG Treater	0002	2	3	D-4823 Caustic Scrubber PSV bypass	MM	5		1.5	gate
3	4820	#2 LPG Treater	0002	3	7	D-4828 Sour LPG Surge Drum PSV bypass	MM	7		1.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4820	#2 LPG Treater	0002	3	8	T-4821 Extractor PSV bypass	MM	5		2	gate
3	4820	#2 LPG Treater	0002	4	13	D-4829 Caustic Settler PSV bypass	MM	5		1.5	gate
3	4820	#2 LPG Treater	0002	5	15	D-4822 Disulfide Separator PSV bypass	MM	5		2	gate
3	4820	#2 LPG Treater	0002	6	21	T-4823 Water Wash PSV bypass	MM	5		2	gate
3	4820	#2 LPG Treater	0002	7	23	D-4826 Spent Caustic / Disulfide PSV bypass	MM	5		3	gate
3	4830	#4 Amine Unit	0002	4	8	D-4830 Amine Still Receiver PSV bypass	MM	7		1.5	gate
3	4840	#3 HP FG Tr.	0002	1	1	T-4840 HP Amine Contactor Ovhd Vapor via PV-410	AO		PV-410	4	
3	4840	#3 HP FG Tr.	0002	1	2	T-4840 HP Amine Contactor PSV bypass	MM	5		1.5	gate
3	4850	#2 LP GRU	0002	1	1	D-4850 Feed Gas KO Drum PSV bypass	MM	7		1.5	gate
3	4850	#2 LP GRU	0002	3	6	C4850 B Gas Recovery Comp. PSV bypass	MO	7		1.5	gate
3	4850	#2 LP GRU	0002	4	8	C4850 A Gas Recovery Comp. PSV bypass	MO	7		1.5	gate
3	4850	#2 LP GRU	0002	5	10	C4850 A/B/C Gas Rec. Comp. Suct. Low range PV	AO	7	PV-516C	6	
3	4850	#2 LP GRU	0002	5	11	C4850 A/B/C Gas Rec. Comp. Suct. High Range PV	AO	7	PV-516B	16	
3	4850	#2 LP GRU	0002	5	12	C4850 C Gas Recovery Comp. PSV bypass	MO	7		1.5	gate
3	4850	#2 LP GRU	0002	1A	17	T-4850 LP Amine Contactor PSV bypass	MM	7		1.5	globe
3	4860	#3 LPG Frac	0002	1	1	D-4860 Feed Surge Drum Off Gas via PV-605B	AO		PV-605B	1	
3	4860	#3 LPG Frac	0002	1	2	D-4864 Feed Surge Drum Off Gas	AO, MO			4	gate
3	4860	#3 LPG Frac	0002	2	7	T-4860 Deethanizer PSV bypass	MM	5		2	gate
3	4860	#3 LPG Frac	0002	4	13	D-4862 Depropanizer Receiver Off Gas	MO			1.5	globe
3	4860	#3 LPG Frac	0002	4	14	T-4861 Depropanizer PSV bypass	MM	5		1.5	gate
3	4860	#3 LPG Frac	0002	5	18	T-4862 Debutanizer PSV bypass	MM	5		1.5	globe

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4860	#3 LPG Frac	0002	6	20	D-4863 Debutanizer Receiver Off Gas	MO			1.5	globe
3	4860	#3 LPG Frac	0002	6	21	P-4869 A Butane Product Pump Seal Pot	O	5		1	gate
3	4860	#3 LPG Frac	0002	6	22	P-4869 B Butane Product Pump Seal Pot	O	5		1	gate
4	3302	E. FG Syst.	0003	8	1	No. 4 Plat Hydrogen via PCV 19A/B	AO	5	PV-19A,B	6,1	
4	3302	E. FG Syst.	0003	8	2	Fuel Gas Header (Line 1210) to Flare via PV-13	AO	5	PV-13/82	4,8	
4	3302	E. FG Syst.	0003	9	9	E-3312 Propane / Butane Vaporizer No.8 PSV bypass	MO	5		1.5	gate
4	4200	#3 Vac	0002	1	1	D-4204 Red. Crude Surge Drum-1st Off Gas via PV-356B	AO	7	PV-356B	2	
4	4200	#3 Vac	0002	11	7	D-4206 Cutterstock Surge Drum via PCV-336B	AO	7	PCV-336B	1	
4	4300	#7 DD	0004	7	18	C-4301C Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4300	#7 DD	0004	7	19	C-4301C Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4300	#7 DD	0004	8	22	C-4301B Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4300	#7 DD	0004	8	23	C-4301B Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4300	#7 DD	0004	9	26	C-4301A Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4300	#7 DD	0004	9	27	C-4301A Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	4	9	C-4401A Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	4	10	C-4401B Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	4	11	C-4401A Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	4	12	C-4401B Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	5	18	C-4401C Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0004	5	19	C-4401C Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	4400	#3 PLAT	0005	9	34	D-4453 Plat Fractionator Rec'r Off Gas via PV-497	AO		PV-497	1.5	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4400	#3 PLAT	0005	9	35	D-4453 Plat Fractionator Rec'r Off Gas via PV-497Bypass	AO			2	globe
4	4400	#3 PLAT	0005	9	36	D-4453 Plat Fractionator Rec'r Off Gas via RO-927	MO	5	RO-927	2	gate
4	4400	#3 PLAT	0005	9	37	D-4453 Plat Fractionator Receiver Vent	MM	5		1.5	globe
4	4400	#3 PLAT	0005	9	38	P-4454a/b Fractionator Ovhd Pumps Sample Vent @ FV-490	MO	7		0.5	needle
4	4400	#3 PLAT	0005	9	39	E-4455 Frac Btms Sample Loop Vent (downstream FI-445)	MO	7		0.5	needle
4	4400	#3 PLAT	0006	2	41	C-4451A Recycle Gas Comp Traps	MO	7		0.75	gate
4	4400	#3 PLAT	0006	3	42	C-4451B Recycle Gas Comp Traps	MO	7		0.75	gate
4	4600	#6 DD	0002	6	4	E-4601 Sample Cooler Vent	MO	7		0.5	gate
4	4600	#6 DD	0002	11	21	C-4601A Recycle Gas Comp Recycle PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	11	22	C-4601A Rec. Gas Comp 1st Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	11	23	C-4601A Rec. Gas Comp 2nd Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	12	30	C-4601B Recycle Gas Comp Recycle PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	12	31	C-4601B Rec Gas Comp 1st Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	12	32	C-4601B Rec Gas Comp 2nd Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	13	37	C-4601C Recycle Gas Comp Recycle PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	13	38	C-4601C RecGas Comp 1st Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0002	13	39	C-4601CB Rec Gas Comp 2nd Stg Disch PSV Bypass	MO	5		1.5	gate
4	4600	#6 DD	0003	1	54	D-4612 Compressor Fuel KO Drum Drain	MO	7		2	gate
4	5300	#9 DD	0003	2	1	D-5308 Fuel Gas KO Drum Drain	MO	5		2	gate
4	5300	#9 DD	0004	7	18	C-5301C Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	5300	#9 DD	0004	7	19	C-5301C Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	5300	#9 DD	0004	8	22	C-5301B Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	5300	#9 DD	0004	8	23	C-5301B Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	5300	#9 DD	0004	9	26	C-5301A Recycle Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	5300	#9 DD	0004	9	27	C-5301A Make-up Gas Comp Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	3	4	D-5402 High Pressure Separator Emergency Dump	MO	5	HV-213	3	gate
4	5400	#4 PLAT	0004	4	9	C-5401A Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	4	10	C-5401B Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	4	11	C-5401A Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	4	12	C-5401B Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	5	18	C-5401C Recycle Gas Comp Recycle Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0004	5	19	C-5401C Recycle Gas Comp MU Discharge PSV Bypass	MO	5		1.5	gate
4	5400	#4 PLAT	0005	6	28	D-5451 Platformer LP Separator Off Gas via HV-531	MO	5	HV-531	4	gate
4	5400	#4 PLAT	0005	9	34	D-5453 Plat Fractionator Rec'r Off Gas via PV-497	AO	5	PV-497	1.5	
4	5400	#4 PLAT	0005	9	35	D-5453 Plat Fractionator Rec'r Off Gas via PV-497 Bypass	AO	5		2	globe
4	5400	#4 PLAT	0005	9	36	D-5453 Plat Fractionator Rec'r Off Gas to FG Header	MO			2	gate
4	5400	#4 PLAT	0005	9	37	P-5454a/b Fractionator Ovhd Pumps Sample Vent @ FV-490	MO	7		1	gate
4	5400	#4 PLAT	0005	9	38	E-5455 Frac Btms Sample Loop Vent	MO	7		1.5	gate
4	5400	#4 PLAT	0006	2	40	C-5451A Recycle Gas Comp Traps	MO	7		0.75	gate
4	5400	#4 PLAT	0006	3	41	C-5451B Recycle Gas Comp Traps	MO	7		0.75	gate
5	3302	E. FG Syst.	0003	7	1	D-7939 Fuel Gas K.O. Drum Fuel Gas	MO	FCC		10	gate
5	3302	East FG Syst	0003	7	2	D-7939 Fuel Gas KO Drum Drains	MO	LP		2	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0007		1	D-7318 Flushing Raffinate Drum Pressure CV	AO	LP	PCV-29	1	
5	7300	Dimersol	0007		2	P-7317 Flushing Raffinate Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0008		4	P-7322 A Propane Seal Flush Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0008		5	P-7322 B Propane Seal Flush Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0010		10	R-7301 1st Reactor Train A Sample Loop Vent	MO	LP		0.25	
5	7300	Dimersol	0010		11	P-7304 A 1st Pump Around Train A Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0010		12	P-7304 B 1st Pump Around Train A Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0010		13	P-7304 C 1st Pump Around Train A Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0011		25	R-7302 A 2nd Reactor Train A Sample Vent	MO	LP		0.25	
5	7300	Dimersol	0011		26	P-7320 B Reactor Pumpout Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0011		27	P-7320 A Reactor Pumpout Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0011		28	P-7305 A 2nd Pumparound Pump Train A Seal Pot Vent #1	O	LP		1	gate
5	7300	Dimersol	0011		29	P-7305 A 2nd Pumparound Pump Train A Seal Pot Vent #2	O	LP		1	gate
5	7300	Dimersol	0012		45	R-7301 B 1st Reactor Train B Sample Vent	MO	LP		0.25	
5	7300	Dimersol	0012		46	P-7306 A 1st Pumparound Train B Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0012		47	P-7306 B 1st Pumparound Train B Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0012		48	P-7306 C 1st Pumparound Train B Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0013		60	R-7302 B 2nd Reactor Train B Sample Vent	MO	LP		0.25	
5	7300	Dimersol	0013		61	P-7307 A 2nd Pumparound Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0013		62	P-7307 B 2nd Pumparound Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0014		78	S-7303 Ammonia Mix Drum Seal Pot Vent	O	LP		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0015		82	D-7307 Caustic Wash Drum Sample Vents	MO	LP		0.25	
5	7300	Dimersol	0015		83	D-7307 Spent Caustic Sample Vents	MO	LP		0.25	
5	7300	Dimersol	0016		86	D-7308 Water Washing Drum Sample Vents	MO	LP		0.25	
5	7300	Dimersol	0016		87	D-7314 Water Degassing Drum Vent	O	LP		1.5	gate
5	7300	Dimersol	0017		90	D-7309 Stabilizer Surge Drum PSV bypass	MM	HP		3	gate
5	7300	Dimersol	0017		91	D-7310 Stabilizer Feed Filter / Coalescer PSV bypass	MM	HP		2	gate
5	7300	Dimersol	0017		92	D-7309 Stabilizer Surge Drum Level Instr Drains	MO	LP		1	gate
5	7300	Dimersol	0017		93	P-7312 A Stabilizer Feed Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0017		94	P-7312 B Stabilizer Feed Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0018		100	E-7306 A / B Stabilize Feed / Btms Exch Shell PSV bypass	MM	LP		2	gate
5	7300	Dimersol	0018		101	E-7306 C / D Stabilizer Feed / Btms Exch. Shell PSV bypass	MM	LP		2	gate
5	7300	Dimersol	0018		102	E-7307 Dimate Product Trim Cooler Sample Vent @ LV-319	MO	LP		0.25	
5	7300	Dimersol	0019		105	T-7301 Stabilizer PSV bypass	MM	HP		2	gate
5	7300	Dimersol	0019		106	T-7301 Stabilizer Level Instr Drains	MO	LP		1	gate
5	7300	Dimersol	0019		107	E-7308 B Stabilizer Reboiler Return Vent	MM	LP		1.5	gate
5	7300	Dimersol	0019		108	E-7308 A Stabilizer Reboiler Return Vent	MM	LP		1.5	gate
5	7300	Dimersol	0019		109	T-7301 Stabilizer Reflux Sample Vent @ FV-320	MO	LP		0.25	
5	7300	Dimersol	0020		115	D-7311 Stabilizer Reflux Drum OFF GAS via PDV-341B	AO		PDV-341B	1	
5	7300	Dimersol	0020		116	D-7311 Stabilizer Reflux Level Instr Drains	MO	LP		1	gate
5	7300	Dimersol	0020		117	D-7311 Stabilizer Reflux PSV bypass	MM	HP		2	gate
5	7300	Dimersol	0020		118	D-7312 Propane Product Filter / Coalescer PSV bypass	MM	HP		1.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0020		119	D-7311 Stabilizer Reflux Drum Boot Sample Vent	MO	LP		0.25	
5	7300	Dimersol	0020		120	D-7311 Stabilizer Reflux Drum Vapor Sample Vent	MO	LP		0.25	
5	7300	Dimersol	0020		121	P-7316 A Stabilizer Reflux Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0020		122	P-7316 B Stabilizer Reflux Pump Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0020		123	P-7315 A Stabilizer Distillate Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0020		124	P-7315 B Stabilizer Distillate Seal Pot Vent	O	LP		1	gate
5	7300	Dimersol	0021		137	D-7313 B Propane Drier PSV bypass	MM	HP		2	gate
5	7300	Dimersol	0021		138	D-7313 A Propane Drier PSV bypass	MM	HP		2	gate
5	7300	Dimersol	0022		146	D-7316 Caustic Degassing Drum Off Gas via PV-440A	AO	LP	PV-400A	1	
5	7300	Dimersol	0045	7	154	Fuel Gas Sweep	O	HP		1	gate
5	7300	Dimersol	0045	8	155	Fuel Gas Sweep	O	LP		1	gate
5	7450	Amine Reg.#6	0006		2	T-7450 Fuel Gas to D-7459	O	LP		1.5	gate
5	7450	Amine Reg.#6	0006		3	D-7458 Sponge Gas KO Drum PSV bypass	MM	HP		3	gate
5	7450	Amine Reg.#6	0006		4	T-7450 Fuel Gas Amine Absorber PSV bypass	MM	HP		3	gate
5	7450	Amine Reg.#6	0006		5	D-7458 Sponge Gas KO Drum Drain	MO	HP		1.5	globe
5	7450	Amine Reg.#6	0006		6	D-7459 Amine / Oil Interface Pot Off Gas	O	LP		3	gate
5	7450	Amine Reg.#6	0006		7	Rich Amine Sample Vent	MO	LP		0.25	
5	7450	Amine Reg.#6	0006		8	Lean Amine Sample Vent	MO	LP		0.25	
5	7450	Amine Reg.#6	0006		9	D-7457 Fuel Gas KO Drum Sample Vent	MO	LP		0.25	
5	7450	Amine Reg.#6	0007		14	D-7452 Rich Amine Flash Drum PSV bypass	MM	LP		2	gate
5	7450	Amine Reg.#6	0007		15	P-7453 A Amine Regenerator Feed Seal Pot Vent	O	LP		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7450	Amine Reg.#6	0007		16	P-7453 B Amine Regenerator Feed Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0007		17	P-7452 A Lean Amine Circulation Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0007		18	P-7452 B Lean Amine Circulation Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0007		19	P-7456 Accumulated Oil Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0008		21	F-7451 Amine Cartridge Filter No. 1 PSV bypass	MO	LP		1	gate
5	7450	Amine Reg.#6	0008		22	D-7453 Amine Storage Drum Off Gas via PV-5186B	AO	LP	PV-5186B	1.5	
5	7450	Amine Reg.#6	0008		23	P-7459 ARU No. 4 Transfer Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0009		29	F-7453 Amine Sump Filter PSV bypass	MO	LP		1	gate
5	7450	Amine Reg.#6	0009		30	F-7452 Amine Cartridge Filter No. 2 PSV bypass	MO	LP		1	gate
5	7450	Amine Reg.#6	0009		31	D-7455 Amine Sump Vent	O	LP		3	gate
5	7450	Amine Reg.#6	0011		40	D-7451 Acid Gas Sample Vent	MO	LP		0.25	
5	7450	Amine Reg.#6	0011		41	P-7451 A Amine Regen Reflux Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0011		42	P-7451 B Amine Regen Reflux Pump Seal Pot Vent	O	LP		1	gate
5	7450	Amine Reg.#6	0013		50	P-7461 A/B Reclaimed Amine Sample Vent @ LV-5260	MO	LP		0.25	
5	7460	Amine Reg.#7	0006		1	Rich Amine Sample Vent	MO	LP		0.25	
5	7460	Amine Reg.#7	0006		2	P-7462A Lean Amine Circulation Pump Seal Pot Vent	O	LP		1	gate
5	7460	Amine Reg.#7	0006		3	P-7462B Lean Amine Circulation Pump Seal Pot Vent	O	LP		1	gate
5	7460	Amine Reg.#7	0007		4	S-7463 Amine Carbon Filter PSV bypass	MO	LP		1	gate
5	7460	Amine Reg.#7	0007		5	F-7461 Amine Cartridge Filter No. 1 PSV bypass	MO	LP		1	gate
5	7460	Amine Reg.#7	0007		6	F-7462 Amine Cartridge Filter No. 2 PSV bypass	MO	LP		1	gate
5	7460	Amine Reg.#7	0009		12	P-7463A Amine Regen Reflux Pump Seal Pot Vent	O	LP		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7460	Amine Reg.#7	0009		13	P-7463B Amine Regen Reflux Pump Seal Pot Vent	O	LP		1	gate
5	7460	Amine Reg.#7	0009		14	D-7461 Amine Regenerator Reflux Drum PSV bypass	MM	LP		1.5	gate
5	7460	Amine Reg.#7	0009		15	D-7461 Acid Gas Sample Vent	MO	LP		0.25	
5	7460	Amine Reg.#7	0009		16	Amine Regenerator Reflux Sample Vent	MO	LP		0.25	
5	7500	LPG Merox	0007		1	D-7508 LPG Sand Filter PSV bypass	MM	HP		2	gate
5	7500	LPG Merox	0007		2	T-7502 LPG Extractor Ovhd Sample Vent	MO	LP		0.25	
5	7500	LPG Merox	0007		3	LPG to SHU Sample Vent	MO	LP		0.25	
5	7500	LPG Merox	0009		6	D-7504 Wash/Naphtha Settler PSV bypass	MM	HP		1.5	gate
5	7500	LPG Merox	0009		7	D-7510 Disulfide / Naphtha Sand Filter PSV bypass	MM	LP		1.5	gate
5	7500	LPG Merox	0010		10	D-7502 Disulfide Separator PSV bypass	MM	LP		2	gate
5	7500	LPG Merox	0012		14	D-7516 Alkaline Waste Water Drum	O	LP		2	gate
5	7500	LPG Merox	0006A		15	T-7501 LPG Amine Absorber PSV bypass	MM	HP		1.5	globe
5	7500	LPG Merox	0006A		16	D-7519 R Amine Coalescer PSV bypass	MM	HP		1.5	globe
5	7500	LPG Merox	0006A		17	T-7501 LPG Rich Amine Absorber Sample Vent	MO	LP		0.25	
5	7500	LPG Merox	0006B		20	D-7501 Caustic Prewash PSV bypass	MM	HP		2	globe
5	7500	LPG Merox	0006B		21	T-7502 LPG Extractor PSV bypass	MM	HP		1.5	globe
5	7500	LPG Merox	0006B		22	D-7519 R Amine Coalescer LPG Sample Vent	MO	LP		0.25	
5	7500	LPG Merox	0006B		23	D-7501 Caustic Pre-Wash Ovhd Sample Vent	MO	LP		0.25	
5	7550	LCN Merox	0006		1	D-7551 LCN Caustic Settler PSV bypass	MM	LP		2	gate
5	7550	LCN Merox	0006		2	D-7551 LCN Caustic Settler Inlet Sample Vent	MO	LP		0.25	
5	7550	LCN Merox	0006		3	D-7551 LCN Caustic Settler Outlet Sample Vent	MO	LP		0.25	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7550	LCN Merox	0007		5	R-7551 LCN Merox Reactor PSV bypass	MM	LP		4	gate
5	7550	LCN Merox	0007		6	P-7552 A/B LCN Caustic Injection Sample Vent	MO	LP		0.25	
5	7550	LCN Merox	0008		8	R-7551 LCN Merox Reactor Outlet Sample Vent @PV-5092	MO	LP		0.25	
5	7550	LCN Merox	0009		9	D-7554 Vent Gas Separator PSV bypass	MM	LP		2	gate
5	7570	HCN Merox	0006		1	Gasoline from Hvy Naphtha Prod Cooler Sample Vent @ FV-7072	MO	LP		0.25	
5	7570	HCN Merox	0007		2	R-7571 Merox Reactor PSV bypass	MM	HP		3	gate
5	7570	HCN Merox	0007		3	R-7571 HCN Merox Reactor Feed Sample Vent	MO	LP		0.25	
5	7570	HCN Merox	0008		5	D-7573 HCN Degassing Drum PSV bypass	MM	HP		2	gate
5	7570	HCN Merox	0008		6	P-7573 A/B HCN Product Sample Vent	MO	LP		0.25	
5	7570	HCN Merox	0008		7	P-7573 A HCN Product Pumps Seal Pot Vent	O	LP		1	gate
5	7570	HCN Merox	0008		8	P-7573 B HCN Product Pumps Seal Pot Vent	O	LP		1	gate
5	7590	C5 Merox	0006		1	D-7592 C5 Sand Filter PSV bypass	MM	HP		1.5	globe
5	7590	C5 Merox	0006		2	T-7591 C5 Extractor PSV bypass	MM	HP		1.5	globe
5	7590	C5 Merox	0006		3	T-7591 C5 Extractor Ovhd Sample Vent	MO	LP		0.25	
5	7590	C5 Merox	0006		4	D-7591 Treated C5's Sample Vent	MO	LP		0.25	
5	7600	Sel Hydrogen.	0006		1	D-7611 Water Degassing Drum Vent	O	LP		2	gate
5	7600	Sel Hydrogen.	0007		2	T-7601 Water Wash Tower PSV bypass	MM	HP		3	gate
5	7600	Sel Hydrogen.	0007		3	T-7601 Water Wash Tower Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0007		4	T-7601 Water Wash Tower Ovhd Sample Vent	MO	LP		0.25	
5	7600	Sel Hydrogen.	0008		7	D-7601 Feed Coalescer / Surge Drum PSV bypass	MM	HP		3	gate
5	7600	Sel Hydrogen.	0008		8	D-7601 Feed Coalescer / Surge Drum OFF GAS via PV-20B	AO		PV-20B	1.5	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7600	Sel Hydrogen.	0008		9	D-7601 Feed Coalescer/ Feed Drum HC Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0008		10	D-7601 Feed Coalescer/ Feed Drum H2O Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0008		11	P-7602A Selective Hydro. Feed Pumps Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0008		12	P-7602B Selective Hydro. Feed Pumps Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0008		13	P-7602 C Selective Hydro. Feed Pumps Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0008		14	P-7602A Selective Hydro. Feed Pumps Seal Pot #1	O	LP		1	gate
5	7600	Sel Hydrogen.	0008		15	P-7602A Selective Hydro. Feed Pumps Seal Pot #2	O	LP		1	gate
5	7600	Sel Hydrogen.	0008		16	P-7602B Selective Hydro. Feed Pumps Seal Pot #1	O	LP		1	gate
5	7600	Sel Hydrogen.	0008		17	P-7602B Selective Hydro. Feed Pumps Seal Pot #2	O	LP		1	gate
5	7600	Sel Hydrogen.	0008		18	P-7602 C Selective Hydro. Feed Pumps Seal Pot #1	O	LP		1	gate
5	7600	Sel Hydrogen.	0008		19	P-7602 C Selective Hydro. Feed Pumps Seal Pot #2	O	LP		1	gate
5	7600	Sel Hydrogen.	0009		22	E-7602 Reactor Feed Trim Heater Line Drain (Shell Side Inlet)	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0009		23	E-7601 A Reactor Feed / Effluent Exch. Drain (Shell Inlet)	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0009		24	E-7601 B/C Reactor Feed / Effluent Exch. Drain (Shell Side)	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0009		25	E-7603 A C3 / C4 Splitter Feed / Btms Exch. Drain (Shell Inlet)	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0009		26	Splitter Feed Sample Vent @ PV-46	MO	LP		0.25	
5	7600	Sel Hydrogen.	0012		31	T-7602 C3/C4 Splitter Drain #1	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0012		32	T-7602 C3/C4 Splitter Drain #2	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0012		33	T-7602 C3/C4 Splitter Drain #3	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0012		34	T-7602 C3/C4 Splitter Top Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0012		35	T-7602 C3/C4 Splitter Bottom Level Inst Drains	MO	LP		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7600	Sel Hydrogen.	0012		36	E-7603 B C3 / C4 Splitter Feed / Btms Exch. Drain (Shell Outlet)	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0012		37	P-7603 A/B C3/C4 Splitter Reflux Sample Vent @ FV-91	MO	LP		0.25	
5	7600	Sel Hydrogen.	0013		49	D-7602 C3/C4 Splitter Receiver OFF GAS	AO			3	
5	7600	Sel Hydrogen.	0013		50	D-7602 C3/C4 Splitter HC Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0013		51	D-7602 C3/C4 Splitter H2O Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0013		52	E-7604 C3/C4 Splitter Ovhd Condenser Vent	MM	LP		1	gate
5	7600	Sel Hydrogen.	0013		53	P-7603 A C3/C4 Splitter Reflux Pump Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0013		54	P-7603 B C3/C4 Splitter Reflux Pump Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0013		55	P-7603 A C3/C4 Splitter Reflux Seal Pot Vent	O	LP		1	gate
5	7600	Sel Hydrogen.	0013		56	P-7603 B C3/C4 Splitter Reflux Seal Pot Vent	O	LP		1	gate
5	7600	Sel Hydrogen.	0014		62	D-7612 Dimersol Feed Coalescer PSV bypass	MM	HP		1.5	gate
5	7600	Sel Hydrogen.	0014		63	D-7612 Dimersol Feed Coalescer Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0014		64	P-7608 A Dimersol Feed Pump Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		65	P-7608 B Dimersol Feed Pump Drains	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		66	E-7607A C3/C4 Splitter Btms Cooler Drain	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		67	E-7607A C3/C4 Splitter Btm Hdr Vent	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		68	E-7607 C3/C4 Splitter Btm Cooler Drain	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		69	E-7610 Propane / Propylene Cooler Drain	MM	LP		1	gate
5	7600	Sel Hydrogen.	0014		70	D-7612 Dimersol Feed Coalescer Drain	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0014		71	T-7602 C3/C4 Splitter Side Draw Sample Vent	MO	LP		0.25	
5	7600	Sel Hydrogen.	0014		72	C4 Product Sample Loop Vent	MO	LP		0.25	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7600	Sel Hydrogen.	0014		73	P-7608 A Dimersol Feed Pump Seal Pot Vent	O	LP		1	gate
5	7600	Sel Hydrogen.	0014		74	P-7608 B Dimersol Feed Pump Seal Pot Vent	O	LP		1	gate
5	7600	Sel Hydrogen.	0017		76	D-7607A Dimersol Feed Drier PSV bypass	MM	HP		2	gate
5	7600	Sel Hydrogen.	0017		77	D-7607B Dimersol Feed Drier PSV bypass	MM	HP		2	gate
5	7600	Sel Hydrogen.	0017		78	S-7603 Dimersol Feed Drier Regeneration Heater PSV bypass	MM	HP		3	gate
5	7600	Sel Hydrogen.	0017		79	D-7607 A Dimersol Feed Drier Vent	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0017		80	D-7607 B Dimersol Feed Drier Vent	MM	LP		1.5	gate
5	7600	Sel Hydrogen.	0019		96	D-7617 Butane Regen. Separator HC Level Instr Vent	MO	LP		1.5	gate
5	7600	Sel Hydrogen.	0019		97	D-7617 Butane Regen. Separator H2O Level Instr Vent	MO	LP		1.5	gate
5	7600	Sel Hydrogen.	0019		98	D-7617 Butane Regen. Separator H2O Level Instr Drains	MO	LP		1.5	gate
5	7600	Sel Hydrogen.	0019		99	E-7616 Butane Regeneration Condenser Drain	MM	LP		1	gate
5	7600	Sel Hydrogen.	0019		100	P-7610 A Butane Regeneration Recycle Pump Seal Pot	O	LP		1	gate
5	7600	Sel Hydrogen.	0019		101	P-7610 B Butane Regeneration Recycle Pump Seal Pot	O	LP		1	gate
5	7600	Sel Hydrogen.	0045	6	115	Fuel Gas Sweep	O	LP		1	globe
5	7600	Sel Hydrogen.	0045	6	116	Fuel Gas Sweep	O	HP		1	globe
5	7600	Sel Hydrogen.	0045	6	117	Analyzer 7602	O	LP		0.5	gate
5	7600	Sel Hydrogen.	0010A		118	R-7601 Selective Hydrogenation Reactor PSV-54 bypass	MM	HP		4	gate
5	7600	Sel Hydrogen.	0010A		119	D-7605 Hydrogen Separator Drain	MO	LP		1.5 (Two)	gate
5	7600	Sel Hydrogen.	0010A		120	D-7605 Hydrogen Separator Level Instr Drains	MO	LP		1	gate
5	7600	Sel Hydrogen.	0010A		121	R-7601 Selective Hydrogenation Reactor Outlet Sample Vent	MO	LP		0.25	
5	7600	Sel Hydrogen.	0010B		125	R-7604 Selective Hydrogenation Reactor PSV bypass	MM	HP		4	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7904	FCC Interconn	0021		3	D-7938 Vent Tank	O	LP		2	gate
5	7904	FCC Interconn	0021		4	P-7937 Vent Gas KO Drum Pump Seal Pot Vent	O	LP		1	gate
5	7904	FCC Interconn	0010A		7	FG H2S Analyzer AE-401 vent to Flare	MO	LP		1.5	gate
6	1070	#6 SWS	0006		1	P-1073 A Stripper Feed Pump Seal Pot Vent	O	3		1	gate
6	1070	#6 SWS	0006		2	P-1073 B Stripper Feed Pump Seal Pot Vent	O	3		1	gate
6	1070	#6 SWS	0009		6	P-1071 A SWS Pumparound Pump Seal Pot Vent	O	3		1	gate
6	1070	#6 SWS	0009		7	P-7401 B SWS Pumparound Pump Seal Pot Vent	O	3		1	gate
6	1070	#6 SWS	0045		10	Fuel Gas Sweep to Flare Header	O	3		0.25	needle
6	4720	#3 SWS	0003	2	1	T-4723 Oil Skimming Drum Off Gas	O	7		4	gate
6	4740	#3 SRU	0003	1	1	T-4741 Clean Acid Gas K O Drum PSV-4625 bypass	MM	7		2	gate
6	4740	#3 SRU	0003	1	2	T-4742 NH3 Acid Gas K O Drum PSV-4626 bypass	MM	7		2	gate
6	4750	#4 SRU	0003	1	1	T-4751 Clean Acid Gas K O Drum PSV-5625 bypass	MM	7		2	gate
6	4750	#4 SRU	0003	1	2	T-4752 NH3 Acid Gas K O Drum PSV-5626 bypass	MM	7		2	gate
6	7400	#5 SWS	0006		1	P-7404 A Sour Water Feed Pump Seal Pot Vent	O	7		1	gate
6	7400	#5 SWS	0006		2	P-7404 B Sour Water Feed Pump Seal Pot Vent	O	7		1	gate
6	7400	#5 SWS	0009		10	P-7401 A SWS Pumparound Pump Seal Pot Vent	O	7		1	gate
6	7400	#5 SWS	0009		11	P-7401 B SWS Pumparound Pump Seal Pot Vent	O	7		1	gate
6	7400	#5 SWS	0045		14	Fuel Gas Sweep to Flare Header	O	7		0.25	needle
6	7920	Refri LPG Stg	0007		9	Tk-7921 LPG Storage Fill Line Drain	MO	LPG		1	gate
6	7920	Refri LPG Stg	0007		10	TK-7921 LPG Storage Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0008		14	P-7921 A Loadout Pump Seal Pot Vent	O	LPG		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	7920	Refri LPG Stg	0008		15	P-7921 B Loadout Pump Seal Pot Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0009		24	16" LPG Dock transfer line Double Block & Bleed Drain	MO	LPG		1	gate
6	7920	Refri LPG Stg	0009		25	P-7921 C Loadout Pumps Casing Seal Pot Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0009		26	P-7922 A Transfer Pumps Casing Seal Pot Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0010		36	P-7922 B Transfer Pumps Casing Seal Pot Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0010		37	P-7922 C Transfer Pumps Casing Seal Pot Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0011		46	Liquid to Dock line Double Block Valve Bleed line Drain	MO	LPG		1	gate
6	7920	Refri LPG Stg	0011		47	Liquid to Dock line Instr Drain	MO	LPG		1	gate
6	7920	Refri LPG Stg	0013		58	C-7921 C Boil Off Compressor Hdr Drain	MO	LPG		1	globe
6	7920	Refri LPG Stg	0013		59	LPG Vapor To / From Dock line Double Block Valve Bleed	MO	LPG		1	gate
6	7920	Refri LPG Stg	0013		60	E-7925 Purger Vent	O	LPG		1	gate
6	7920	Refri LPG Stg	0022		84	Fuel Gas to Flare Purge	O	LPG		1	gate
6	7940	Flare	0006		1	D-7941 L. P. Flare K O Drum HP Equalization	O	LP		6	gate
6	7940	Flare	0006		2	P-7941 A LP Flare KO Drum Pumps Seal Pot Vent	O	LP		1	gate
6	7940	Flare	0006		3	P-7941 B LP Flare KO Drum Pumps Seal Pot Vent	O	LP		1	gate
6	7940	Flare	0009		5	P-7942 A HP Flare KO Drum Pumps Seal Pot Vent	O	HP		1	gate
6	7940	Flare	0009		6	P-7942 B HP Flare KO Drum Pumps Seal Pot Vent	O	HP		1	gate
7	8500	DELAYED COKER	106		1	P-8506A Fractionator Sour Water Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		2	P-8506B Fractionator Sour Water Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		3	P-8509A HCGO Product Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		4	P-8509B HCGO Product Pump Seal Pot	O	LP		0.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	106		5	P-8510A LCGO Product Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		6	P-8510B LCGO Product Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		7	P-8515A Lean Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		8	P-8515B Lean Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		9	P-8518 Slop Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		10	P-8520A Splitter Bottoms Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		11	P-8520B Splitter Bottoms Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		12	P-8521A Splitter Overhead Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		13	P-8521B Splitter Overhead Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		14	P-8522A Blowdown Tower Bottoms Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		15	P-8522B Blowdown Tower Bottoms Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		16	P-8525A Blowdown Sour Water Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		17	P-8525B Blowdown Sour Water Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		18	P-8526A Blowdown Slop Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		19	P-8526B Blowdown Slop Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		20	P-8541A HCGO Seal Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		21	P-8541B HCGO Seal Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		22	P-8542 LCGO Flush Oil Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		23	P-8512A Compressor Suction Drum Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		24	P-8512B Compressor Suction Drum Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		25	P-8516A Debutanizer Overhead Pump Seal Pot	O	LP		0.5	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	106		26	P-8516B Debutanizer Overhead Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		27	P-8514A Stripper Feed Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		28	P-8514B Stripper Feed Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		29	P-8519A Rich Amine Transfer Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		30	P-8519B Rich Amine Transfer Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		31	P-8513A Compressor Interstage K.O. Drum Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		32	P-8513B Compressor Interstage K.O. Drum Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		33	P-8508A Unstabilized Naphtha Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		34	P-8508B Unstabilized Naphtha Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		35	P-8507A Fractionator Reflux Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		36	P-8507B Fractionator Reflux Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		37	P-8505A LCGO Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		38	P-8505B LCGO Pump Seal Pot	O	LP		0.5	gate
7	8500	DELAYED COKER	106		39	P-8504A HCGO Pump Seal Pot #1	O	LP		0.5	gate
7	8500	DELAYED COKER	106		40	P-8504A HCGO Pump Seal Pot #2	O	LP		0.5	gate
7	8500	DELAYED COKER	106		41	P-8504B HCGO Pump Seal Pot #1	O	LP		0.5	gate
7	8500	DELAYED COKER	106		42	P-8504B HCGO Pump Seal Pot #2	O	LP		0.5	gate
7	8500	DELAYED COKER	116		64	D-8505 Fractionator Ovhd Drum Off Gas via PV-1308	AO	LP	PV-1308	12	
7	8500	DELAYED COKER	116		65	P-8507A Fractionator Reflux Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	116		66	P-8507B Fractionator Reflux Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	117		71	P-8506A Fractionator Sour Water Pump Discharge Vent	O	LP		2	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	117		72	P-8506B Fractionator Sour Water Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	117		73	P-8506A/B Fractionator Sour Water Pump Discharge SC Vent	MO	LP	SP-203	0.25	
7	8500	DELAYED COKER	117		74	P-8508A Unstabilized Naphtha Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	117		75	P-8508B Unstabilized Naphtha Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	130		80	P-8512A Compressor Suction Drum Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	130		81	P-8512B Compressor Suction Drum Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	132		86	D-8507 Compressor Interstage K.O. Drum PSV bypass	MM	LP		6	gate
7	8500	DELAYED COKER	132		87	D-8507 Compressor Interstage K.O. Drum Sour Water SC Vent	MO	LP	SP-206	0.25	
7	8500	DELAYED COKER	132		88	P-8513A Compressor Suction Drum Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	132		89	P-8513B Compressor Suction Drum Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	133		91	C-8501 Coker Gas Compressor 2nd Stage Discharge Vent	MO	LP		2	gate
7	8500	DELAYED COKER	134		92	D-8508 Compressor High Pressure Receiver PSV bypass	MM	LP		3	gate
7	8500	DELAYED COKER	134		93	P-8514A Stripper Feed Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	134		94	P-8514B Stripper Feed Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	135		96	Lean Oil Feed to T-8505 Primary Absorber SC Vent	MO	LP	SP-207	0.25	
7	8500	DELAYED COKER	136		97	P-8515A Lean Oil Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	136		98	P-8515B Lean Oil Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	137		99	T-8506 Sponge Absorber PSV bypass	MM	LP		2	gate
7	8500	DELAYED COKER	139		101	D-8510 Debutanizer Overhead Drum Off Gas via PV-2456 bypass	MM	LP		2	globe
7	8500	DELAYED COKER	139		102	P-8516A Debutanizer Overhead Pump Discharge Vent	O	LP		2	gate
7	8500	DELAYED COKER	139		103	P-8516B Debutanizer Overhead Pump Discharge Vent	O	LP		2	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	140		106	T-8509 Coker Gas Absorber Off Gas	MO			8	gate
7	8500	DELAYED COKER	140		107	T-8509 Coker Gas Absorber PSV bypass	MM	LP		2	gate
7	8500	DELAYED COKER	141		109	T-8510 LPG Contactor PSV bypass	MM	LP		2	gate
7	8500	DELAYED COKER	143		114	LPG Product from MSY-8504 LPG Transfer Package SC Vent	MO	LP	SP-210	0.25	
7	8500	DELAYED COKER	143		115	LPG from D-8529 Amine Coalescer Drum SC Vent	MO	LP	SP-222	0.25	
7	8500	DELAYED COKER	143		116	P-8543B DSO Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	143		117	P-8543A DSO Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	144		118	D-8528 Caustic Degassing Drum Vent	O	LP		3	gate
7	8500	DELAYED COKER	145		119	D-8511 Rich Amine Flash Drum PSV bypass	MM	LP		4	gate
7	8500	DELAYED COKER	146		122	P-8520A Splitter Bottoms Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	146		123	P-8520B Splitter Bottoms Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	147		126	D-8512 Naphtha Splitter Ovhd Receiver PSV bypass	MM	LP		2	gate
7	8500	DELAYED COKER	147		127	Lt. Coker Naphtha from E-8566 SC Vent	MO	LP	SP-211	0.25	
7	8500	DELAYED COKER	147		128	P-8521A Splitter Overhead Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	147		129	P-8521B Splitter Overhead Pump Discharge Vent	O	LP		1	gate
7	8500	DELAYED COKER	147		130	E-8561 Naphtha Splitter Ovhd Condenser Non Condensable Vent #1	O	LP		1	gate
7	8500	DELAYED COKER	147		131	E-8561 Naphtha Splitter Ovhd Condenser Non Condensable Vent #2	O	LP		1	gate
7	8500	DELAYED COKER	149		140	D-8535 Fuel Gas K.O. Drum Off Gas via PV-6053	AO		PV-6053	6	
7	8500	DELAYED COKER	149		141	D-8535 Fuel Gas K.O. Drum PSV bypass	MM	LP		2	gate
7	8500	DELAYED COKER	149		142	Fuel Gas Line from D-8535 Fuel Gas K.O. Drum SC Vent	MO	LP	SP-208	0.25	
7	8500	DELAYED COKER	149		143	Hvy Coker Naphtha from E-8560 Outlet Line SC Vent	MO	LP	SP-212	0.25	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	183		148	D-8513 Blowdown Overhead Separator Off Gas via PV-4693	AO		PV-4693	4	
7	8500	DELAYED COKER	183		149	P-8525A/B Blowdown Sour Water Pumps discharge SC Vent	MO	LP	SP-205	0.25	
7	8500	DELAYED COKER	188		155	D-8592 1st Stage Phase Separator Level Bridle Vent	MO	LP		0.5	gate
7	8500	DELAYED COKER	188		156	D-8592 1st Stage Phase Separator Ovhd C3/C4 line SC Vent	MO	LP	SP-224	0.25	
7	8500	DELAYED COKER	188		157	FFC-8592 18" Fiber-Film TM Contactor Vent	MO	LP		2 & 1.5	gate
7	8500	DELAYED COKER	188		158	LPG to FFC-8592 18" Fiber-Film TM Contactor Feed Line Drain	MO	LP		1	gate
7	8500	DELAYED COKER	189		159	D-8593 2nd Stage Phase Separator Level Bridle Vent	MO	LP		1	gate
7	8500	DELAYED COKER	189		160	FFC-8593 18" Fiber-Film TM Contactor Vent	MO	LP		2 & 1.5	gate
7	8500	DELAYED COKER	190		161	T-8513 Oxidizer Tower PSV-2674 bypass	MM	LP		3	globe
7	8500	DELAYED COKER	191		163	D-8594 DSO Gravity Separator Off Gas via PV-5054	AO	LP	PV-5054	1.5	
7	8500	DELAYED COKER	191		164	D-8594 DSO Gravity Separator PSV-2673 bypass	MM	LP		2	gate
7	8500	DELAYED COKER	210		170	D-8536 Sour Fuel Gas K.O. Drum PSV bypass	MM	LP		1	gate
7	8500	DELAYED COKER	210		171	D-8536 Sour Fuel Gas K.O. Drum Off Gas	AO, MO			3	gate
7	8500	DELAYED COKER	210		172	D-8536 Sour Fuel Gas K.O. Drum Off Gas Line SC Vent	MO	LP	SP-219	0.25	
7	8500	DELAYED COKER	210		173	D-8536 Sour Fuel Gas K.O. Drum Off Gas Line AT-2663 Analyzer Vent	MO	LP	AT-2663	1	gate
7	8500	DELAYED COKER	215		178	D-8538 LCGO Flush Oil Surge Drum Off Gas via PCV-6252	MO	LP	PCV-6252	2	
7	8500	DELAYED COKER	222		181	D-8537 HCGO Seal Oil Surge Drum Off Gas via PCV-6602	MO	LP	PCV-6602	2	
7	8500	DELAYED COKER	247		184	D-8541 DCB Drum Off Gas	MO	LP		3	gate
7	8500	DELAYED COKER	248		185	D-8546 DCM Amine Sump Drum Off Gas via PCV-7902	MO	LP	PCV-7902	2	
7	8500	DELAYED COKER	143 & 188		189	D-8592 1st Stage Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2676	MM	LP		1.5	gate
7	8500	DELAYED COKER	143 & 188		190	Vent from MSY-8504 LPG Transfer Pkg (1st Stage Phase Separator D-8592)	MO	LP	VT-25	2	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	143 & 189		192	D-8593 2nd Stage Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2675	MM	LP		1.5	gate
7	8500	DELAYED COKER	143 & 189		193	Vent from MSY-8504 LPG Transfer Pkg (2nd Stage Phase Separator D-8593)	MO	LP	VT-24	2	gate
7	8500	DELAYED COKER	143 & 192		197	D-8595 Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2672 bypass	MM	LP		2	gate
7	8500	DELAYED COKER	143 & 193		199	F-8580 Sand Filter (in MSY-8504 LPG Transfer Pkg) PSV-2671 bypass	MM	LP		1.5	gate
7	8700	COKER FLARE SYSTEM	27		1	P-8703A Coker Flare K.O. Drum Pump Seal Pot	O	LP		1	gate
7	8700	COKER FLARE SYSTEM	27		2	P-8703B Coker Flare K.O. Drum Pump Seal Pot	O	LP		1	gate
PH1	1101	#1 GT	0003	4	1	GG-1101 No. 1 Gas Turbine Vent	MO	3		1	gate
PH1	1101	#1 GT	0003	6	2	E-1113A No.1 Vaporizer via PV-62	AO	3	PV-62	1	
PH1	1101	#1 GT	0003	6	3	S-1131 Separator Fuel Gas	MO	3		3	plug
PH1	1101	#1 GT	0003	6	4	S-1131 Separator Drain	MO	3		1.5	gate
PH1	1102	#2 GT	0003	4	1	GG-1102 No. 2 Gas Turbine Vent	MO	3		1 (**)	gate
PH1	1102	#2GT	0003	6	2	E-1113B No.2 Vaporizer via PV-62	AO	3	PV-62	1	
PH1	1102	#2GT	0003	6	3	S-1132 Separator Fuel Gas	MO	3		3	plug
PH1	1102	#2GT	0003	6	4	S-1132 Separator Drain	MO	3		1.5	gate
PH1	1103	#3 GT	0003	4	1	GG-1103 No. 3 Gas Turbine Vent	MO	3		1	gate
PH1	1103	#3 GT	0003	6	2	E-1113C No.3 Vaporizer via PV-62	AO	3	PV-62	1	
PH1	1103	#3 GT	0003	6	3	S-1143 Separator Fuel Gas	MO	3		3	plug
PH1	1103	#3 GT	0003	6	4	S-1143 Separator Drain	MO	3		1.5	gate
PH2	3404	#4 GT	0003	1	1	D-3404 Raffinate Hold. Drum Blanket. Gas via PCV-3	AO	7	PCV-3	1	globe
PH2	3404	#4 GT	0003	6	3	E-3414 No. 4 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	
PH2	3404	#4 GT	0003	6	4	S-3424 Fuel Gas Separator Drain	MO	7		1	gate

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
PH2	3404	#4 GT	0003	6	5	GG-3404 No. 4 Gas Turbine Vent	MO	7		1	gate
PH2	3404	#4 GT	0003	6	6	S-3424 Fuel Gas Separator Vent	MM	7		1	gate
PH2	3405	#5 GT	0003	6	1	E-3455 No. 5 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	
PH2	3405	#5 GT	0003	6	2	S-3435 Fuel Gas Separator Drain	MO	7		1	gate
PH2	3405	#5 GT	0003	6	3	GG-3405 No. 5 Gas Turbine Vent	MO	7		1	gate
PH2	3405	#5 GT	0003	6	4	D-3458 FCC Fuel Gas K.O. Drum Drain	MO	7		2	gate
PH2	3405	#5 GT	0003	6	5	S-3435 Fuel Gas Separator Vent	MM	7		1	gate
PH2	3405	#5 GT	0003	6	6	S-3435 Fuel Gas Separator Level Switch Drain	MO	7		1	gate
PH2	3406	#6 GT	0003	6	1	E-3446 No. 6 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	
PH2	3406	#6 GT	0003	6	2	S-3426 Fuel Gas Separator Drain	MO	7		1.5	gate
PH2	3406	#6 GT	0003	6	3	GG-3406 No. 6 Gas Turbine Vent	MO	7		0.75	gate
PH2	3406	#6 GT	0003	6	4	S-3426 Fuel Gas Separator Vapor Line Vent	MM	7		1	globe
PH2	3407	#7 GT	0003	6	1	E-3447 No. 7 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	
PH2	3407	#7 GT	0003	6	2	S-3407 Fuel Gas Separator Drain	MO	7		1.5	gate
PH2	3407	#7 GT	0003	6	3	GG-3407 No. 7 Gas Turbine	MO	7		0.75	gate
PH2	3407	#7 GT	0003	6	4	S-3407 Fuel Gas Separator Vapor Line Vent	MM	7		1	globe
PH2	3408	#8 GT	0003	5	1	E-3418 No. 8 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	
PH2	3408	#8 GT	0003	5	2	S-3408 Fuel Gas Separator Drain	MO	7		1.5	gate
PH2	3408	#8 GT	0003	5	3	GG-3408 No. 8 Gas Turbine Vent	MO	7		0.75	gate
PH2	3408	#8 GT	0003	5	4	S-3408 Fuel Gas Separator Vapor Line Vent	MM	7		1	globe
PH2	3409	#9 GT	0003	5	1	E-3419 No. 9 Vaporizer Pressure Controller PV-62	AO	7	PV-62	1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
PH2	3409	#9 GT	0003	5	2	S-3409 Fuel Gas Separator Drain	MO	7		1.5	gate
PH2	3409	#9 GT	0003	5	3	GG-3409 No. 9 Gas Turbine Vent	MO	7		0.75	gate
PH2	3409	#9 GT	0003	5	4	S-3409 Fuel Gas Separator Vapor Line Vent	MM	7		1	globe
PH2	3410	#10 GT	0009		2	E-3422 Propane Vaporizer Press Controller PV-1054	AO	7	PV-1054	1.5	
PH2	3410	#10 GT	0009		3	D-3427 Fuel Gas Separator Drain	MO	7		1	gate
PH2	3410	#10 GT	0009		4	D-3427 Fuel Gas Separator Liq thru Level Controller LV-1069	AO	7	LV-1069	1	globe
UT2	1150	Boilers1-5	0003	18	1	D-1160 Treating Gas Balance Drum Drain	MO	3		4	gate
UT3	3301	UT3	0006	13	1	D-3355 Boiler 6/7 Fuel Gas K O Drum Off Gas	MO			8	gate
UT3	3301	UT3	0006	13	2	D-3358 Boiler 8/9 Fuel Gas K O Drum Off Gas	MO			8	gate
UT3	3301	UT3	0006	13	3	D-3355 Boiler 6/7 Fuel Gas K O Drum drain	MO	7		2	gate
UT3	3301	UT3	0006	13	4	D-3358 Boiler 8/9 Fuel Gas KO Drum drain	MO	7		2	gate
UT3	9055	UT3	0003	6	1	D-3359 Naph Fuel Surge Tk Blanket Gas via PV-65	AO	7	PV-65	2	
1	0160	Util. Frac	0005	3	1	T-160 Fractionation Tower PSV	S	3	PSV-21	6x10	
1	0160	Util. Frac	0005	3	2	T-160 Fractionation Tower PSV	S	3	PSV-22	6x10	
1	0160	Util. Frac	0005	4	3	D-160 Overhead Receiver PSV	S	3	PSV-6	3x4	
1	0160	Util. Frac	0005	4	4	D-160 Overhead Receiver PSV bypass	MM	3		4	
1	0160	Util. Frac	0005	4	5	D-160 Overhead Receiver Off Gas via PV-3A	AO	3	PV-3A	6	
1	0160	Util. Frac	0005	4	6	D-160 Overhead Receiver Off Gas via PV-3A bypass	MM	3		6	
1	0160	Util. Frac	0005	4	7	E-165 OVHD Condenser Vent	MM	3		1	
1	0200	Penex	0002	3	1	R-201/2 Reactor No.1 A & 1B PSV	S	3	PSV-57	2x3	
1	0200	Penex	0002	3	2	E-279 Charge Heater Outlet PSV	S	3	PSV-50	4x6	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	0200	Penex	0002	3	3	R-203/4 Reactor No. 2A & 2B PSV	S	3	PSV-61	2x3	
1	0200	Penex	0002	3	4	D-214 Reactor Prod. Separator PSV	S	3	PSV-67	4x6	
1	0200	Penex	0002	3	5	R-201/2/3/4 Reactor Drain	MM	3		3	
1	0200	Penex	0002	3	6	R-201/2/3/4 Reactor Drain	MM	3		1½	
1	0200	Penex	0002	4	10	C-200A Penex Recycle Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	4	11	C-200A Penex Recycle Gas Compr Disch BB&Bleed Vent	MM			1½	
1	0200	Penex	0002	4	12	C-200A Penex Recycle Gas Compr Disch PSV	S	3	PSV-85	3x4	
1	0200	Penex	0002	4	13	C-200A Unifining Recycle Compr Suction Vent	MM			1	
1	0200	Penex	0002	4	14	C-200A Unifining Recycle Compr Disch.BB&Bleed Vent	MM			1½	
1	0200	Penex	0002	4	15	C-200A Unifining Recycle Compr. Disch PSV	S	3	PSV-94	1x2	
1	0200	Penex	0002	4	16	C-200A Make-up Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	4	17	C-200A Make-up Gas Compr Disch. BB&Bleed Vent	MM			1½	
1	0200	Penex	0002	4	18	C-200A Make-up Gas Compressor Disch PSV	S	3	PSV-101	1x2	
1	0200	Penex	0002	4	19	C-200B Penex Recycle Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	4	20	C-200B Penex Recycle Gas Compr Disch BB&BleedVent	MM			1½	
1	0200	Penex	0002	5	24	C-200B Penex Recycle Gas Compr Disch PSV	S	3	PSV-113	3x4	
1	0200	Penex	0002	5	25	C-200B Unifining Recycle Compr Suction Vent	MM			1	
1	0200	Penex	0002	5	26	C-200B Unifining Recycle Compr Disch.BB&BleedVent	MM			1½	
1	0200	Penex	0002	5	27	C-200B Unifining Recycle Compr. Disch PSV	S	3	PSV-121	1x2	
1	0200	Penex	0002	5	28	C-200B Make-up Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	5	29	C-200B Make-up Gas Compr Disch.BB&Bleed Vent	MM			1½	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	0200	Penex	0002	5	30	C-200B Make-up Gas Compressor Disch PSV	S	3	PSV-130	1x2	
1	0200	Penex	0002	6	34	C-200C Penex Recycle Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	6	35	C-200C Penex Recycle Gas Compr Disch BB&Bleed Vent	MM			1½	
1	0200	Penex	0002	6	36	C-200C Penex Recycle Gas Compr Disch PSV	S	3	PSV-145	3x4	
1	0200	Penex	0002	6	37	C-200C Unifining Recycle Compr Suction Vent	MM			1	
1	0200	Penex	0002	6	38	C-200C Unifining Recycle Compr Disch. BB&BleedVent	MM			1½	
1	0200	Penex	0002	6	39	C-200C Unifining Recycle Compr. Disch PSV	S	3	PSV-152	1x2	
1	0200	Penex	0002	6	40	C-200C Make-up Gas Compr Suction Vent	MM			1	
1	0200	Penex	0002	6	41	C-200C Make-up Gas Compr Disch. BB&BleedVent	MM			1½	
1	0200	Penex	0002	6	42	C-200C Make-up Gas Compressor Disch PSV	S	3	PSV-161	1x2	
1	0200	Penex	0002	6	43	D-276 Make-up Compressor Suction Drum PSV	S	3	PSV-170	1½x2	
1	0200	Penex	0002	7	45	S-276A Make-up Gas Drier PSV	S	3	PSV-172	1x2	
1	0200	Penex	0002	7	46	S-276B Make-up Gas Drier PSV	S	3	PSV-180	1x2	
1	0200	Penex	0002	7	47	S-276A Outlet Vent	MM	3		1	
1	0200	Penex	0002	7	48	S-276B Outlet Vent	MM	3		1	
1	0200	Penex	0002	7	49	E-276 Regeneration Condenser Inlet PSV	S	3	PSV-186	3x4	
1	0200	Penex	0002	7	50	E-276 Regeneration Condenser Vent	MM	3		1	
1	0200	Penex	0002	7	51	D-218 Knock Out Pot PSV	S	3	PSV-635	1½x1½	
1	0200	Penex	0002	7	52	D-218 K.O. Pot PSV Bypass	MM	3		1	
1	0200	Penex	0002	7	53	D-279 Regen. Surge Drum Off Gas via PV-185B bypass	MM	3		1.5	
1	0200	Penex	0002	7	54	D-279 Regenerate Surge Drum PSV	S	3	PSV-190	2x3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	0200	Penex	0002	8	55	E-277 Drier Regeneration Heater Tube PSV	S	3	PSV-199	4x6	
1	0200	Penex	0002	8	56	T-202 Stabilizer PSV	S	3	PSV-222	4x6	
1	0200	Penex	0002	8	57	T-202 Stabilizer PSV	S	3	PSV-224	4x6	
1	0200	Penex	0002	9	58	D-207 Stabilizer Receiver Off Gas	AO				
1	0200	Penex	0002	9	59	P-276A/B Stabilizer Reflux Pumps Vent	MM	3		1	
1	0200	Penex	0002	10	63	D-302 K.O. Drum PSV	S	3	PSV-4	2x3	
1	0200	Penex	0002	10	64	T-276 Stabilizer Gas Scrubber PSV	S	3	PSV-237	2x3	
1	0200	Penex	0002	10	65	D-288 Auxiliary Stabilizer Gas Scrubber PSV	S	3	PSV-479	2x3	
1	0200	Penex	0002	1A	66	S-275A Liquid Feed Drier PSV	S	3	PSV-1	4x6	
1	0200	Penex	0002	1A	67	S-275B Liquid Feed Drier PSV	S	3	PSV-7	4x6	
1	0200	Penex	0002	1B	69	D-275 Feed Surge Drum PSV	S	3	PSV-11	4x6	
1	0200	Penex	0002	1B	70	D-275 Feed Surge Drum Off Gas via PV-12B Bypass	MM	3		1½	
1	0200	Penex	0002	1C	71	D-280 Chloride Injection Drum PSV	S	3	PSV-21	3x4	
1	0200	Penex	0002	1C	72	F-278 Feed Filter PSV	S	3	PSV-491	¾ x 1	
1	0200	Penex	0002	1C	73	F-278 Feed Filter PSV Bypass	MM	3		1	
1	0200	Penex	0003	1	74	D-200 Charge Surge Drum PSV	S	3	PSV-245	4x6	
1	0200	Penex	0003	1	75	D-200 Charge Surge Drum Off Gas via PV-246B	AO	3	PV-246B	1	
1	0200	Penex	0003	1	76	D-200 Charge Surge Dr Off Gas via PV-246B bypass	MM	3		1½	
1	0200	Penex	0003	3	78	D-202 Unifying Product Separator PSV	S	3	PSV-283	2½x4	
1	0200	Penex	0003	3	79	D-202 Unifying Prod. Sep. Emerg. Dump via HCV-284	AE	3	HCV-284	1½	
1	0200	Penex	0003	4	81	T-200 Stripper Column PSV	S	3	PSV-315	6x8	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	0200	Penex	0003	4	82	D-203 Stripper Receiver Off Gas via PV-316	AO		PV-316	1	
1	0200	Penex	0003	4	83	D-203 Stripper Receiver Off Gas via PV-316 bypass	MM			3	
1	0200	Penex	0004	1	85	D-277 Hot Oil Surge Dr Off Gas via PV-349B bypass	MM			1.5	
1	0200	Penex	0004	1	86	D-277 Hot Oil Surge Drum PSV	S	3	PSV-348	3x4	
1	0200	Penex	0006	2	88	D-215 Fuel Gas Balance Drum PSV	S	3	PSV-383	4x6	
1	0200	Penex	0009	1	89	D-208 Gas Eng. Fuel Gas Drum PSV	S	3	PSV-15	1x2	
1	0200	Penex	0009	1	90	D-208 Gas Eng. Fuel Gas Drum PSV Bypass	MM	3		1	
1	0200	Penex	0010	1	92	D-295 Dry Drum PSV	S	3	PSV-671	1½x2	
1	0200	Penex	0011	1	93	D-209 LSR Sump Inlet PSV	S	3	PSV-672	4x6	
1	0200	Penex	0011	1	94	D-209 LSR Sump Inlet PSV bypass	MM	3		1½	
1	0200	Penex	0011	1	95	D-209 LSR Outlet Sump Off Gas	MO			4	
1	0200	Penex	0011	1	96	D-209 LSR Sump Outlet PSV	S	3	PSV-492	3x4	
1	0200	Penex	0011	1	97	D-209 LSR Sump Outlet PSV bypass	MM	3		4	
1	1651	Gas/LPG Load.	0002	1	2	Ethyl Mercaptan Injection Pot PSV	S	3		0.5x0.5	
1	1651	Gas/LPG Load.	0002	1	3	Truck Loading Rack Vapor Return Vent	MM	3		2	
1	1900	W Interconn.	0003	14	3	D-206 Gas Scrubber PSV	S	2	PSV-227	2x3	
1	1900	W Interconn.	0003	19	6	E-1906 LPG Air Cooler Vent	MM	3		1	
1	1902	W FG Syst.	0002	1	1	E-940 C3/C4 Vaporizer #3 Off Gas	AO, MO		PCV-941	4	
1	1902	W FG Syst.	0002	1	2	E-940 C3/C4 Vaporizer #3 PSV	S		PSV-941	3x4	
1	1902	W FG Syst.	0002	1	3	E-940 C3/C4 Vaporizer #3 PSV/PCV bypass	MM			4	
1	1902	W FG Syst.	0002	1	4	E-912 C3/C4 Vaporizer #4 Off Gas	AO, MO			4	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
1	1902	W FG Syst.	0002	1	5	E-912 C3/C4 Vaporizer #4 PSV	S		PSV-150	2x3	
1	1902	W FG Syst.	0002	1	6	E-912 C3/C4 Vaporizer #4 PCV/PSV bypass	MM			2	
1	1902	W FG Syst.	0002	2	9	D-905 Treating Gas Balance Drum PSV	S	2	PSV-103	6x8	
1	1902	W FG Syst.	0002	3	14	D-1110 Fuel Gas Balance Drum PSV	S	3	PSV-009	1½x3	
1	1902	W FG Syst.	0002	3	15	D-1110 Fuel Gas Bal Drum Off Gas via PV-321A	MM	3		3	
1	9005	C4 & C3 Syst	0003	1	2	Propane From Storage Vent	MM	3		3	
3	3100	#5CDU	0005	6	4	D-3106 Sour Gas K.O. Drum Off Gas	O	7		6	
3	3100	#5CDU	0005	11	6	D-3111 Fuel Gas KO Drum PSV	S	7	PSV-453	2x3	
3	3100	#5CDU	0005	15	8	D-3103 Crude Tower OH Rcvr. Main Off Gas	MO			12	
3	3100	#5CDU	0005	15	9	D-3103 Crude Tower OVHD Receiver PSV	S	7	PSV-345	8x10	
3	3100	#5CDU	0005	15	10	D-3103 Crude Tower OVHD Receiver PSV	S	7	PSV-346	8x10	
3	3100	#5CDU	0005	15	11	D-3103 Crude Tower OVHD Receiver via PCV-347A	AO	7	PCV-347A	8	
3	3100	#5CDU	0005	15	12	D-3103 Crude Tower OH Rcvr. via PCV-347A bypass	MM	7		8	
3	3100	#5CDU	0005	15	13	D-3103 Crude Tower OH Rcvr. Feed bypass	ME			10	
3	3100	#5CDU	0005	22	15	C-3101 Gas Recovery Compressor Discharge PSV	S	7	PSV-365	3x4	
3	3100	#5CDU	0005	22	16	T-3108 Stab. Feed Contactor PSV	S	7	PSV-374	3x4	
3	3100	#5CDU	0005	22	17	T-3108 Stab. Feed Contactor via PCV-376 B	AO	7	PCV-376 B	3	
3	3100	#5CDU	0005	22	18	T-3108 Stab. Feed Contactor via PCV-376 B bypass	MM	7		3	
3	3100	#5CDU	0005	22	19	T-3108 Stab. Feed Contactor via Manual Valve	ME			3	
3	3100	#5CDU	0005	24	21	D-3104 Light Naphtha OVHD Rcvr..PSV	S	7	PSV-421	3x4	
3	3100	#5CDU	0005	24	22	D-3104 Light Naphtha OVHD Rcvr.. PSV bypass	MM	7		3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	3100	#5CDU	0005	24	23	D-3104 Light Naphtha OVHD Rcvr.. via PCV 420B bypass	MM	7		1½	
3	3100	#5CDU	0005	24	24	D-3104 Light Naphtha OVHD Rcvr.. via Manual Valve	O			2	
3	3201	#1 LPG Tr.	0004	1	1	T-3202 LPG Amine Contactor PSV	S	7	PSV-237	3x4	
3	3201	#1 LPG Tr.	0004	1	2	T-3202 LPG Amine Contactor Ovhd Vent	MM	7		1	
3	3201	#1 LPG Tr.	0004	2	3	E-3253 LPG Product Cooler PSV	S	7	PSV-314	1x1	
3	3201	#1 LPG Tr.	0004	2	4	E-3253 LPG Product Cooler PSV bypass	MM	7		1	
3	3201	#1 LPG Tr.	0004	2	5	D-3202 Caustic Scrubber PSV	S	7	PSV-310	2.5x4	
3	3201	#1 LPG Tr.	0004	2	6	D-3202 Caustic Scrubber PSV Bypass	MM	7		1.5	
3	3201	#1 LPG Tr.	0004	2	7	T-3206 Extractor PSV	S	7	PSV-312	2.5x4	
3	3201	#1 LPG Tr.	0004	2	8	T-3206 Extractor PSV bypass	MM	7		1.5	
3	3201	#1 LPG Tr.	0004	4	9	T-3207 Sand Filter	S	7	PSV-316	2.5x4	
3	3201	#1 LPG Tr.	0004	4	10	T-3207 Sand Filter PSV Bypass	MM	7		1.5	
3	3201	#1 LPG Tr.	0004	5	11	D-3204 Oxidizer PSV	S	7	PSV-124	1.5x2.5	
3	3201	#1 LPG Tr.	0004	6	12	D-3210 Vent Tank Off Gas	MM	7		2	
3	3201	#1 LPG Tr.	0004	6	13	D-3206 Disulfide Separator Vent Gas	AO	7	PCV-148	1	
3	3201	#1 LPG Tr.	0004	6	14	D-3206 Disulfide Separator PCV bypass	MM	7		1	
3	3201	#1 LPG Tr.	0004	6	15	D-3206 Disulfide Separator PCV or bypass	MM	7		2	
3	3201	#1 LPG Tr.	0004	6	16	D-3206 Disulfide Separator PSV	S	7	PSV-144	4x6	
3	3201	#1 LPG Tr.	0004	6	17	D-3206 Disulfide Separator PSV bypass	MM	7		2	
3	3202	DeiC5/iC5	0004	1	1	T-3201 Deisopentanizer PSV	S	7	PSV-21	8x10	
3	3202	DeiC5/iC5	0004	2	3	D-3201 Deisopentanizer Ovhd Rcvr PSV	S	7	PSV-24	4x6	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	3202	DeiC5/iC5	0004	2	4	D-3201 Deisopentimizer Ovhd Rcvr Off Gas via PCV-30	AO	7	PCV-30	4	
3	3202	DeiC5/iC5	0004	2	5	D-3201 DeiC5 Ovhd Rcvr Off Gas via PCV-30 bypass	MM	7		6	
3	3202	DeiC5/iC5	0004	3	6	T-3204 Mixer PSV	S	7	PSV-152	3x4	
3	3202	DeiC5/iC5	0004	3	7	D-3207 Caustic Settler PSV	S	7	PSV-111	4x6	
3	3202	DeiC5/iC5	0004	4	9	D-3208 Sand Filter PSV	S	7	PSV-115	4x6	
3	3300	E. Interconn.	0003	46	1	Sour LPG Feed Line Vent	MM	5		1	
3	3302	E. FG Syst.	0003	1	6	D-3354 FG Balance Drum PSV	S	7	PSV-79	6x8	
3	3302	E. FG Syst.	0003	1	7	D-3354 FG Balance Drum PSV bypass	MM	7		1.5	
3	3302	E. FG Syst.	0003	1	8	D-3307 Fuel Gas KO Drum PSV	S	7	PSV-657	6x8	
3	3302	E. FG Syst.	0003	1	9	D-3307 Fuel Gas KO Drum PSV Bypass	MM	7		1.5	
3	3302	E. FG Syst.	0003	1	10	D-3307 Fuel Gas KO Drum Off Gas Side Stream	MO			3	
3	3302	E. FG Syst.	0003	1	11	D-3307 Fuel Gas KO Drum via PCV Bypass	MM	7		3	
3	3302	E. FG Syst.	0003	2	14	E-3301 LPG Vaporizer No. 6 PSV	S	7	PSV-663	3x4	
3	3302	E. FG Syst.	0003	2	15	E-3310 LPG Vaporizer No. 7 PSV	S	7	PSV-87	2x3	
3	3302	E. FG Syst.	0003	3	18	E-7935 No. 9 Vaporizer C3 Gas via FV-735 bypass	MM			1	
3	3302	E. FG Syst.	0003	3	19	E-7935 No. 9 Vaporizer PSV	S	7	PSV-736	3x4	
3	3302	E. FG Syst.	0003	3	20	E-7935 No. 9 Vaporizer PSV bypass	MM	7		3	
3	3302	E. FG Syst.	0003	6	22	PSV from Blanket Gas Header	S	6	PSV-139	1.5x2	
3	3302	E. FG Syst.	0003	8	23	East Refinery Fuel / Tie Line PSV	S	5	PSV-22	4x6	
3	3302	E. FG Syst.	0003	8	24	East Refinery Fuel / Tie Line PSV Bypass	MM	5		1.5	
3	3302	E. FG Syst.	0003	9	25	E-3312 C3/C4 Vaporizer No. 8 C3/C4 Gas via FV-70	AO		FV-70	4	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	3302	E. FG Syst.	0003	9	26	E-3312 Propane/Butane Vaporizer No. 8 PSV	S	5	PSV-69	2x3	
3	3302	E. FG Syst.	0003	9	27	E-3312 Propane/Butane Vaporizer No. 8 PSV Bypass	S	5		1.5	
3	3302	E. FG Syst.	0003	10	29	Line No. 1110 Platformer Start-Up H2 Header PSV	S		PSV-150	1x1	
3	3302	E. FG Syst.	0003	10	30	Line No. 1110 Platformer Start-Up H2 Header PSV	S		PSV-132	1x2	
3	4100	#6CDU	0005	4	1	D-4101A 1st Stage Desalter Vent	MM	7		2	
3	4100	#6CDU	0005	5	2	D-4101 2nd Stage Desalter Vent	MM	7		2	
3	4100	#6CDU	0005	6	4	D-4105 Desalter Water Make-up DrumVent	MO	7		1	
3	4100	#6CDU	0005	6	5	D-4106 Sour Gas K.O. Drum Off Gas	O	7		6	
3	4100	#6CDU	0005	22	28	T-4108 Stabilizer Feed Contactor PSV	S	7	PSV-374	3x4	
3	4100	#6CDU	0005	22	29	T-4108 Stab Fd Contactor Off Gas via PV-376B bypass	MM	7		3	
3	4100	#6CDU	0005	22	30	T-4108 Stabilizer Feed Contactor via Manual Valve	ME	7		3	
3	4100	#6CDU	0005	24	32	D-4104 Lt. Naphtha Stab. Ovhd Receiver PSV	S	7	PSV-421	3x4	
3	4100	#6CDU	0005	24	33	D-4104 Lt. Naphtha Stab. Ovhd Receiver PSV bypass	MM	7		3	
3	4100	#6CDU	0005	24	34	D-4104 Lt. Naph Stab Ovhd Rec'r via PV-420B bypass	MM	7		1½	
3	4100	#6CDU	0005	24	35	D-4104 Light Naphtha OVHD Rcvr.. via Manual Valve	MO			2	
3	4100	#6CDU	0005	25	36	T-4109 Lt. Naphtha Fractionator PSV	S	7	PSV-621	8x10	
3	4100	#6CDU	0005	26	38	D-4111 Lt. Naphtha Fractionator OVHD Rec. PSV	S	7	PSV-624	4x6	
3	4810	Disul Oil Rec.	0002	1	2	D-4816 Sand Filter PSV	S	7	PSV-115	4x6	
3	4810	Disul Oil Rec.	0002	1	3	D-4816 Sand Filter PSV bypass	MM	7		2	
3	4810	Disul Oil Rec.	0002	2	5	D-4813 Settling Drum PSV	S	7	PSV-167	1½x2 ½	
3	4810	Disul Oil Rec.	0002	2	6	D-4813 Settling Drum PSV bypass	MM	7		1½	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4810	Disul Oil Rec.	0002	3	8	D-4818 Disulfide Water Wash Drum PSV	S	7	PSV-161	1½x2½	
3	4810	Disul Oil Rec.	0002	3	9	D-4818 Disulfide Water Wash Drum PSV bypass	MM	7		1	
3	4810	Disul Oil Rec.	0002	3	10	D-4819 Merox Vent KO Drum PSV	S	7	PSV-174	1½x2½	
3	4810	Disul Oil Rec.	0002	3	11	D-4819 Merox Vent KO Drum Off Gas	MO	7		3	
3	4810	Lean oil Abs.	0004	2	15	T-4811 Absorber Tower PSV	S	7	PSV-002	4x6	
3	4810	Lean oil Abs.	0004	2	16	T-4812 KO Drum PSV	S	7	PSV-001	4x6	
3	4810	Lean oil Abs.	0004	2	17	T-4812 KO Drum PSV Bypass	MM	7		1.5	
3	4820	#2 LPG Treater	0002	1	2	T-4824 Amine Contactor PSV	S	5	PSV-6	3x4	
3	4820	#2 LPG Treater	0002	2	4	D-4823 Caustic Scrubber PSV	S	5	PSV-19	2½x4	
3	4820	#2 LPG Treater	0002	2	5	D-4824 Spent Caustic Flash Drum PSV	S	5	PSV-10	2½x4	
3	4820	#2 LPG Treater	0002	2	6	D-4824 Spent Caustic Flash Drum Off Gas	MM	5		2	
3	4820	#2 LPG Treater	0002	3	9	T-4821 Extractor PSV	S	5	PSV-20	2½x4	
3	4820	#2 LPG Treater	0002	3	10	D-4828 Sour LPG Surge Drum PSV	S	7	PSV-80	3x4	
3	4820	#2 LPG Treater	0002	3	11	P-4828A Sour LPG Surge Drum Seal Pot Vent	MM	7		½	
3	4820	#2 LPG Treater	0002	3	12	P-4828B Sour LPG Surge Drum Seal Pot Vent	MM	7		½	
3	4820	#2 LPG Treater	0002	4	14	D-4829 Caustic Settler PSV	S	5	PSV-12	3x4	
3	4820	#2 LPG Treater	0002	5	16	D-4820 K.O. Pot Off Gas via PCV-41	AO	5		1	
3	4820	#2 LPG Treater	0002	5	17	D-4820 K.O. Pot Off Gas via PCV-41bypass	MM	5		1	
3	4820	#2 LPG Treater	0002	5	18	D-4820 K.O. Pot Off Gas via PCV-41	AO	5		1	
3	4820	#2 LPG Treater	0002	5	19	D-4820 K.O. Pot Off Gas via PCV-41bypass	MM	5		1	
3	4820	#2 LPG Treater	0002	5	20	D-4822 Disulfide Separator PSV	S	5	PSV-38	2x3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4820	#2 LPG Treater	0002	6	22	T-4823 Water Wash PSV	S	5	PSV-50	2½x4	
3	4820	#2 LPG Treater	0002	7	24	D-4826 Spent Caustic/Disulfide PSV	S	5	PSV-60	1½x3	
3	4830	#4 Amine Unit	0002	1	1	D-4831 Rich Amine Flash Drum PSV	S	7	PSV-304	4x6	
3	4830	#4 Amine Unit	0002	1	2	D-4831 Rich Amine Flash Dr. Off Gas via PCV-3000	AO	7	PCV-3000	1	
3	4830	#4 Amine Unit	0002	1	3	D-4831 Rich Amine Flash Dr. Off Gas via PCV bypass	MM	7		2	
3	4830	#4 Amine Unit	0002	1	4	D-4831 Rich Amine Flash Dr. Off Gas via PCV bypass	MM	7		3	
3	4830	#4 Amine Unit	0002	3	5	T-4830 Amine Still PSV	S	7	PSV-356	4x6	
3	4830	#4 Amine Unit	0002	3	6	D-4832 Amine Storage Drum PSV	S	7	PSV-339	6x8	
3	4830	#4 Amine Unit	0002	3	7	D-4832 Amine Storage Drum Off Gas	MM	7		3	
3	4830	#4 Amine Unit	0002	4	10	D-4830 Amine Still Receiver PSV	S	7	PSV-360	1½x2	
3	4830	#4 Amine Unit	0002	4	11	D-4830 Amine Still Rec'r Acid Gas via S-4831	MO	7		12	
3	4830	#4 Amine Unit	0002	4	12	D-4830 Amine Still Rec'r Acid Gas bypassing S-4831	MO	7		12	
3	4840	#3 HP FG Tr.	0002	1	4	D-4840 Feed Gas KO Drum Off Gas	MO			10	
3	4840	#3 HP FG Tr.	0002	1	5	D-4840 Feed Gas KO Drum PSV	S	5	PSV-416	4x6	
3	4840	#3 HP FG Tr.	0002	1	6	D-4840 Feed Gas KO Drum PSV bypass	MM	5		4	
3	4840	#3 HP FG Tr.	0002	1	7	D-4840 Feed Gas KO Drum Drain bypassing LV-403	MM	5		1	
3	4840	#3 HP FG Tr.	0002	1	8	T-4840 HP Amine Contactor PSV	S	5	PSV-407	1½x3	
3	4850	#2 LP GRU	0002	1	2	D-4850 Feed Gas KO Drum PSV	S	7	PSV-503	6x8	
3	4850	#2 LP GRU	0002	2	3	D-4851 Compressor Suction KO Drum Main Gas	ME	7		24	
3	4850	#2 LP GRU	0002	2	4	D-4851 Compressor Suction KO Drum PSV	S	7		3x4	
3	4850	#2 LP GRU	0002	2	5	D-4851 Compressor Suction KO Drum PSV bypass	MM	7		1½	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4850	#2 LP GRU	0002	3	7	C-4850 B Gas Recovery Compressor Outlet PSV	S	7	PSV-549	4x6	
3	4850	#2 LP GRU	0002	4	9	C-4850 A Gas Recovery Compressor Outlet PSV	S	7	PSV-533	4x6	
3	4850	#2 LP GRU	0002	5	13	C-4850 C Gas Recovery Compressor Outlet PSV	S	7	PSV-588	4x6	
3	4850	#2 LP GRU	0002	6	14	D-4852 Product Separator Off Gas	AO, MO				
3	4850	#2 LP GRU	0002	6	15	D-4852 Product Separator PSV	S	7	PSV-553	3x4	
3	4850	#2 LP GRU	0002	6	16	D-4852 Product Separator PSV bypass	MM	7		1½	
3	4850	#2 LP GRU	0002	1A	18	T-4850 LP Amine Contactor PSV	S	7	PSV-507	3x4	
3	4850	#2 LP GRU	0004	1	19	TK-4850B Lube Oil Console Off Gas	O			2	
3	4850	#2 LP GRU	0004	2	20	TK-4850A Lube Oil Console Off Gas	O			2	
3	4850	#2 LP GRU	0004	3	21	TK-4850C Lube Oil Console Off Gas	O			2	
3	4860	#3 LPG Frac	0002	1	3	D-4860 Feed Surge Drum PSV	S	5	PSV-601	3x4	
3	4860	#3 LPG Frac	0002	1	4	D-4860 Feed Surge Drum PSV bypass	MM	5		1½	
3	4860	#3 LPG Frac	0002	1	5	D-4864 Feed Surge Drum PSV	S	5	PSV-678	3x4	
3	4860	#3 LPG Frac	0002	1	6	D-4864 Feed Surge Drum PSV bypass	MM	5		2	
3	4860	#3 LPG Frac	0002	2	8	T-4860 Deethanizer PSV	S	5	PSV-618	3x4	
3	4860	#3 LPG Frac	0002	3	9	D-4861 Deethanizer Receiver PSV	S	5	PSV-626	2½x4	
3	4860	#3 LPG Frac	0002	3	10	D-4861 Deethanizer Receiver PSV bypass	MM	5		1½	
3	4860	#3 LPG Frac	0002	3	11	D-4861 Deethanizer Receiver Off Gas via PV-630	AO		PV-630	1	
3	4860	#3 LPG Frac	0002	3	12	D-4861 Deethanizer Receiver Off Gas via PV-605A	MO		PV-605A	1	
3	4860	#3 LPG Frac	0002	4	15	T-4861 Depropanizer PSV	S	5	PSV-639	4x6	
3	4860	#3 LPG Frac	0002	4	16	D-4862 Depropanizer Receiver PSV	S	5	PSV-655	2½x4	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
3	4860	#3 LPG Frac	0002	4	17	D-4862 Depropanizer Receiver PSV bypass	MM	5		1½	
3	4860	#3 LPG Frac	0002	5	19	T-4862 Debutanizer PSV	S	5	PSV-659	6x10	
3	4860	#3 LPG Frac	0002	6	23	D-4863 Debutanizer Receiver PSV	S	5	PSV-672	3x4	
3	4860	#3 LPG Frac	0002	6	24	D-4863 Debutanizer Receiver PSV bypass	MM	5		1½	
3	4860	#3 LPG Frac	0002	6	25	P-4869 A Butane Product Pump Drains	MM	5		0.75	
3	4860	#3 LPG Frac	0002	6	26	P-4869 B Butane Product Pump Drains	MM	5		0.75	
3	5830	#5 Amine Unit	0002	3	1	T-5830R Amine Still PSV	S	7	PSV-356	4x6	
3	5830	#5 Amine Unit	0002	4	2	D-5830 Amine Still Receiver PSV	S	7	PSV-360	1½x2	
3	5830	#5 Amine Unit	0002	4	3	D-5830 Amine Still Receiver PSV bypass	MM	7		1½	
3	5830	#5 Amine Unit	0002	4	4	D-5830 Amine Still Rec'r Acid Gas via S-5831	MO	7		12	
3	5830	#5 Amine Unit	0002	4	5	D-5830 Amine Still Rec'r Acid Gas Bypassing S-5831	MO	7		12	
3	5830	#5 Amine Unit	0002	4	6	D-5837 Skim Pot Off Gas	MM	7		1.5	
4	3302	E. FG Syst.	0003	8	3	No. 4 Plat Hydrogen PSV	S	5	PSV-22	4x6	
4	3302	E. FG Syst.	0003	8	4	No. 4 Plat Hydrogen PSV	S	5	PSV-22	4x6	
4	3302	E. FG Syst.	0003	8	5	No. 4 Plat Hydrogen PSV bypass	MM	5		1.5	
4	3302	E. FG Syst.	0003	8	6	No. 4 Plat Hydrogen via PCV-20 bypass	MM			2	
4	3302	E. FG Syst.	0003	8	7	No. 4 Plat Hydrogen via PCV 19A/B bypass	MM			6	
4	3302	E. FG Syst.	0003	8	8	Fuel Gas Header (Line 1210) to Flare	MM	5		1.5	
4	3302	E. FG Syst.	0003	9	10	E-3312 C3/C4 Vaporizer No.8 Vapor via FV-70	AO		FV-70	4	
4	3302	E. FG Syst.	0003	9	11	E-3312 Propane/Butane Vaporizer No.8 PSV	S	5,7	PSV-69	2x3	
4	3302	E. FG Syst.	0003	10	1	Line No. 1110 Platformer Start-Up H2 Header PSV	S		PSV-150	1x1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	3302	E. FG Syst.	0003	10	2	Line No. 1110 Platformer Start-Up H2 Header PSV	S		PSV-132	1x2	
4	4200	#3 Vac	0002	1	2	D-4204 Reduced Crude Surge Drum-1st PSV	S	7	PSV-357	6x8	
4	4200	#3 Vac	0002	1	3	D-4204 Red. Crude Surge Drum-1st Off Gas via PV-356B Bypass	MM	7		2	
4	4200	#3 Vac	0002	9	4	D-4201 Condensator Gas K.O. Drum Sour Gas	MO				
4	4200	#3 Vac	0002	9	5	D-4203 Oily Condensate Drum PSV	S	7	PSV-252	1.5x2	
4	4200	#3 Vac	0002	9	6	D-4209 Oily Condensate Collection Drum PSV	S	7	PSV-341	1.5x2	
4	4200	#3 Vac	0002	11	8	D-4206 Cutterstock Surge Drum PSV	S	7	PSV-335	4x6	
4	4200	#3 Vac	0002	11	9	D-4206 Cutterstock Surge Drum via PCV Bypass	MM	7		2	
4	4200	#3 Vac	0003	2	11	D-4205 Heater Fuel Gas KO Drum PSV	S	7	PSV-712	3x4	
4	4300	#7 DD	0003	2	2	D-4308 Fuel Gas KO Drum PSV	S	5	PSV-514	2.5x4	
4	4300	#7 DD	0003	2	3	D-4308 Fuel Gas KO Drum PSV Bypass	MM	5		1.5	
4	4300	#7 DD	0004	1	4	D-4301 Feed Surge Drum PSV	S	5	PSV-4	6x8	
4	4300	#7 DD	0004	1	5	D-4301 Feed Surge Drum Off Gas via PV-3B	AO	5	PV-3B	2	
4	4300	#7 DD	0004	1	6	D-4301 Feed Surge Drum Off Gas via PV-3B Bypass	MM	5		2	
4	4300	#7 DD	0004	5	7	D-4302 Reactor Effluent Separator PSV	S	5	PSV-96	4x6	
4	4300	#7 DD	0004	5	8	D-4302 Reactor Effluent Separator Off Gas via HCV-296	AE	5	HCV-296	3	
4	4300	#7 DD	0004	5	9	E-4302A/B Reactor Effluent Condensers	MM	5		3	
4	4300	#7 DD	0004	6	10	D-4302 Reactor Effluent Separator Off Gas via FV-121	AO	5	FV-121	1	
4	4300	#7 DD	0004	6	11	D-4302 Reactor Effluent Separator via HCV-249 on FV-121 Bypass	MM	5	HCV-249	1	
4	4300	#7 DD	0004	6	12	D-4305 LP Flash Drum PSV	S	5	PSV-107	6x10	
4	4300	#7 DD	0004	6	13	D-4305 LP Flash Drum PSV	S	5	PSV-108	6x8	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4300	#7 DD	0004	6	14	D-4305 LP Flash Drum PSV-107 Bypass	MM	5		3	
4	4300	#7 DD	0004	6	15	D-4305 LP Flash Drum Off Gas via PV -109	AO	5	PV-109	1.5	
4	4300	#7 DD	0004	6	16	D-4305 LP Flash Drum Off Gas via PV-109 Bypass	MM	5		2	
4	4300	#7 DD	0004	6	17	D-4302/D-4305 Off Gas Closed Sampling System	MO	5		1	
4	4300	#7 DD	0004	7	20	C-4301C Make-up Gas Compressor Discharge PSV	S	5	PSV-153	1x2	
4	4300	#7 DD	0004	7	21	C-4301C Recycle Gas Compressor Discharge PSV	S	5	PSV-147	1.5x2.5	
4	4300	#7 DD	0004	8	24	C-4301B Make-up Gas Compressor Discharge PSV	S	5	PSV-140	1x2	
4	4300	#7 DD	0004	8	25	C-4301B Recycle Gas Compressor Discharge PSV	S	5	PSV-135	1.5x2.5	
4	4300	#7 DD	0004	9	28	C-4301A Make-up Gas Compressor Discharge PSV	S	5	PSV-132	1x2	
4	4300	#7 DD	0004	9	29	C-4301A Recycle Gas Compressor Discharge PSV	S	5	PSV-124	1.5x2.5	
4	4300	#7 DD	0004	10	30	D-4304 Make-Up Suction Drum PSV	S	5	PSV-160	2.5x4	
4	4300	#7 DD	0004	12	31	T-4301 Stripper PSV	S	5	PSV-217	6x8	
4	4300	#7 DD	0004	14	32	D-4306 Stripper Receiver PSV	S	5	PSV-218	3x4	
4	4300	#7 DD	0004	14	33	D-4306 Stripper Receiver Off Gas via PV-220	AO	5	PV-220	6	
4	4300	#7 DD	0004	14	34	D-4306 Stripper Receiver Off Gas via PV-220 Bypass	MM	5		6	
4	4300	#7 DD	0004	14	35	D-4306 Off Gas Closed Sampling System	MO	5		1	
4	4400	#3 PLAT	0004	1	1	D-4401 Feed Surge Drum PSV	S	7	PSV-1	6x8	
4	4400	#3 PLAT	0004	1	2	D-4401 Feed Surge Drum Off Gas via PV-2B	AO	7	PV-2B	2	
4	4400	#3 PLAT	0004	1	3	D-4401 Feed Surge Drum via PV-2B Bypass	MM	7		2	
4	4400	#3 PLAT	0004	3	4	D-4402 High Pressure Separator PSV	S	5	PSV-68	4x6	
4	4400	#3 PLAT	0004	3	5	D-4402 High Pressure Separator Emergency Dump	ME	5	HCV-213	3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4400	#3 PLAT	0004	3	6	D-4404 Make-up Gas Comp Suction Drum PSV	S	5	PSV-90	1x2	
4	4400	#3 PLAT	0004	3	7	D-4402 High Pressure Separator Off Gas via FV-77	AO	5	FV-77	1	
4	4400	#3 PLAT	0004	3	8	D-4402 High Pressure Separator Off Gas via FV-77 Bypass	MM	5		1.5	
4	4400	#3 PLAT	0004	4	13	C-4401A/B/C Recycle Gas Compr Pack Vent	MO	7		1.5	
4	4400	#3 PLAT	0004	4	14	C-4401A Recycle Gas Comp MU Discharge PSV	S	5	PSV-94	1x2	
4	4400	#3 PLAT	0004	4	15	C-4401A Recycle Gas Comp Recycle Discharge PSV	S	5	PSV-100	2x3	
4	4400	#3 PLAT	0004	4	16	C-4401B Recycle Gas Comp MU Discharge PSV	S	5	PSV-105	1x2	
4	4400	#3 PLAT	0004	4	17	C-4401B Recycle Gas Comp Recycle Discharge PSV	S	5	PSV-111	2x3	
4	4400	#3 PLAT	0004	5	20	C-4401C Recycle Gas Comp MU Discharge PSV	S	5	PSV-123	1x2	
4	4400	#3 PLAT	0004	5	21	C-4401C Recycle Gas Comp Recycle Discharge PSV	S	5	PSV-129	2x3	
4	4400	#3 PLAT	0004	6	22	T-4401 Stripper PSV	S	5	PSV-178	6x8	
4	4400	#3 PLAT	0004	6	23	T-4401 Stripper PSV	S	5	PSV-179	6x8	
4	4400	#3 PLAT	0004	6	24	T-4401 Stripper PSV	S	5	PSV-180	6x8	
4	4400	#3 PLAT	0004	7	25	D-4405 Stripper Receiver PSV	S	5	PSV-216	2.5x4	
4	4400	#3 PLAT	0004	7	26	D-4405 Stripper Receiver Off Gas via PV-188	AO	5	PV-188	1.5	
4	4400	#3 PLAT	0004	7	27	D-4405 Stripper Receiver Off Gas via PV-188 Bypass	MM	5		2	
4	4400	#3 PLAT	0005	6	28	D-4451 Platformer LP Separator PSV	S	5	PSV-375	6x10	
4	4400	#3 PLAT	0005	6	29	D-4451 Platformer LP Separator PSV	S	5	PSV-376	6x8	
4	4400	#3 PLAT	0005	6	30	D-4451 Platformer LP Separator PSV	S	5	PSV-377	6x8	
4	4400	#3 PLAT	0005	6	31	D-4451 Platformer LP Separator Off Gas via HV-531	ME	5	HV-531	4	
4	4400	#3 PLAT	0005	8	32	T-4451 Fractionator PSV	S	5	PSV-495	6x8	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4400	#3 PLAT	0005	8	33	T-4451 Fractionator PSV	S	5	PSV-496	6x8	
4	4400	#3 PLAT	0005	9	40	D-4453 Plat Fractionator Receiver PSV	S	5	PSV-541	2.5x4	
4	4400	#3 PLAT	0008	2	44	D-4459 Fuel Gas KO Drum PSV	S	5	PSV-613	4x6	
4	4400	#3 PLAT	0008	2	45	D-4459 Fuel Gas KO Drum PSV Bypass	MM	5		1.5	
4	4600	#6 DD	0002	3	1	D-4601 Feed Surge Drum PSV	S	7	PSV-10	6x8	
4	4600	#6 DD	0002	3	2	D-4601 Feed Surge Drum Off Gas via PV-9B	AO	7	PV-9B	2	
4	4600	#6 DD	0002	3	3	D-4601 Feed Surge Drum Off Gas via PV-9B Bypass	MM	7		3	
4	4600	#6 DD	0002	8	5	D-4610 Recycle Gas Separator Off Gas	MO			12	
4	4600	#6 DD	0002	8	6	D-4610 Recycle Gas Separator PSV	S	5	PSV-145	1x2	
4	4600	#6 DD	0002	8	7	D-4602 Reactor Effluent Separator PSV	S	5	PSV-128	4x6	
4	4600	#6 DD	0002	8	8	D-4602 Reactor Effluent Separator via HCV-130	AE	5	HCV-130	3	
4	4600	#6 DD	0002	8	9	E-4602 A/B Reactor Effluent Separator Condensers	MM	5		3	
4	4600	#6 DD	0002	8	10	D-4616 Degasing Drum PSV	S	5	PSV-400	1x2	
4	4600	#6 DD	0002	9	11	T-4601 Recycle Gas Amine Scrubber PSV Bypass	S	5	PSV-157	1x2	
4	4600	#6 DD	0002	9	12	T-4601 Recycle Gas Amine Scrubber PSV Bypass	MM	5		1	
4	4600	#6 DD	0002	10	13	D-4603 Low Pressure Flash Drum PSV	S	5	PSV-164	6x8	
4	4600	#6 DD	0002	10	14	D-4603 Low Pressure Flash Drum PSV	S	5	PSV-165	6x8	
4	4600	#6 DD	0002	10	15	D-4603 Low Pressure Flash Drum PSV Bypass	MM	5		3	
4	4600	#6 DD	0002	10	16	D-4603 Low Pressure Flash Drum via PV-170	AO	5	PV-170	3	
4	4600	#6 DD	0002	10	17	D-4603 Low Press. Flash Drum via PV-170 bypass	MM	5		3	
4	4600	#6 DD	0002	10	18	D-4604 Recycle Comp Suction Drum	S	5	PSV-177	1x2	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4600	#6 DD	0002	10	19	D-4604 Rec. Comp Suct.Drum Off Gas via FV-178	AO	5	FV-178	3	
4	4600	#6 DD	0002	10	20	D-4604Rec.Comp Suct.Dr Off Gas via HCV-179	MM	5	HCV-179	3	
4	4600	#6 DD	0002	11	24	C-4601A Recycle Gas Comp 1st Stg Discharge PSV	S	5	PSV-190	1.5x2.5	
4	4600	#6 DD	0002	11	25	C-4601A Recycle Gas Comp 2nd Stg Discharge PSV	S	5	PSV-254	1x2	
4	4600	#6 DD	0002	11	26	C-4601A Recycle Gas Comp Recycle PSV	S	5	PSV-262	2x3	
4	4600	#6 DD	0002	11	27	D-4609 Make-up Comp Interstage Drum PSV	S	5	PSV-214	3x4	
4	4600	#6 DD	0002	11	28	D-4609 MU Comp Interstage Drum PSV Bypass	MM	5		1.5	
4	4600	#6 DD	0002	11	29	C-4601A Recycle Gas Comp Vent Gas	MM	5		1.5	
4	4600	#6 DD	0002	12	33	C-4601B Recycle Gas Comp 1st Stg Discharge PSV	S	5	PSV-225	1.5x2.5	
4	4600	#6 DD	0002	12	34	C-4601B Recycle Gas Comp 2nd Stg Discharge PSV	S	5	PSV-197	1x2	
4	4600	#6 DD	0002	12	35	C-4601B Recycle Gas Comp Recycle PSV	S	5	PSV-239	2x3	
4	4600	#6 DD	0002	12	36	C-4601B Recycle Gas Comp Recycle Vent	MM	5		1.5	
4	4600	#6 DD	0002	13	40	C-4601C Recycle Gas Comp 1st Stg Discharge PSV	S	5	PSV-247	1.5x2.5	
4	4600	#6 DD	0002	13	41	C-4601C Recycle Gas Comp 2nd Stg Discharge PSV	S	5	PSV-232	1x2	
4	4600	#6 DD	0002	13	42	C-4601C Recycle Gas Comp Recycle PSV	S	5	PSV-205	2x3	
4	4600	#6 DD	0002	13	43	C-4601C Recycle Gas Comp Recycle Vent	MM	5		1.5	
4	4600	#6 DD	0002	14	44	D-4605 Make-up Compressor Suction Drum PSV	S	5	PSV-269	4x6	
4	4600	#6 DD	0002	14	45	D-4605 Make-up Comp Suction Drum PSV Bypass	MM	5		1.5	
4	4600	#6 DD	0002	14	46	D-4614 Lean MEA Surge Drum Off Gas via PV-274B	AO	5	PV-274B	1	
4	4600	#6 DD	0002	14	47	D-4614 Lean MEA Surge DrOff Gas via PV-274B Bypass	AO	5	PV-274B	1.5	
4	4600	#6 DD	0002	14	48	D-4614 Lean MEA Surge Drum PSV	S	5	PSV-276	1.5x2.5	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	4600	#6 DD	0002	15	49	T-4602 Stripper PSV	S	7	PSV-304	6x8	
4	4600	#6 DD	0002	15	50	E-4606 Stripper Ovhd Condenser Vent	MM	7		1	
4	4600	#6 DD	0002	16	51	D-4606 Stripper Ovhd Receiver PSV	S	7	PSV-325	4x6	
4	4600	#6 DD	0002	16	52	D-4606 Stripper Ovhd Rec'r via PV-331	AO	5	PV-331	6	
4	4600	#6 DD	0002	16	53	D-4606 Stripper Ovhd Rec'r via PV-331 Bypass	MM	5		6	
4	4600	#6 DD	0003	1	55	D-4612 Compressor Fuel KO Drum PSV	S	5	PSV-501	2x3	
4	4600	#6 DD	0003	1	56	D-4612 Compressor Fuel KO Drum PSV Bypass	MM	5		1.5	
4	4600	#6 DD	0004	2	58	D-4615 Fuel Gas KO Drum PSV	S	7	PSV-453	1.5x2.5	
4	5300	#9 DD	0003	2	2	D-5308 Fuel Gas KO Drum PSV	S	5	PSV-514	2.5x4	
4	5300	#9 DD	0003	2	3	D-5308 Fuel Gas KO Drum PSV Bypass	MM	5		1.5	
4	5300	#9 DD	0004	1	4	D-5301 Feed Surge Drum PSV	S	5	PSV-4	6x8	
4	5300	#9 DD	0004	1	5	D-5301 Feed Surge Drum Off Gas via PV-3B	AO	5	PV-3B	2	
4	5300	#9 DD	0004	1	6	D-5301 Feed Surge Drum Off Gas via PV-3B Bypass	MM	5		2	
4	5300	#9 DD	0004	5	7	D-5302 Reactor Effluent Separator PSV	S	5	PSV-96	4x6	
4	5300	#9 DD	0004	5	8	D-5302 Reactor Effluent Separator Off Gas via HCV-296	AE	5	HCV-296	3	
4	5300	#9 DD	0004	5	9	E-5302A/B Reactor Effluent Condensers	MM	5		3	
4	5300	#9 DD	0004	5	10	D-5302 Reactor Effluent Separator Off Gas via FV-121	AO	5	FV-121	1	
4	5300	#9 DD	0004	6	11	D-5302 Reactor Effluent Separator Off Gas via HCV-249 on FV-121 Bypass	MM	5	HCV-249	1	
4	5300	#9 DD	0004	6	12	D-5305 LP Flash Drum PSV	S	5	PSV-107	6x10	
4	5300	#9 DD	0004	6	13	D-5305 LP Flash Drum PSV	S	5	PSV-108	6x8	
4	5300	#9 DD	0004	6	14	D-5305 LP Flash Drum PSV-107 Bypass	MM	5		3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	5300	#9 DD	0004	6	15	D-5305 LP Flash Drum Off Gas via PV-109	AO	5	PV-109	1.5	
4	5300	#9 DD	0004	6	16	D-5305 LP Flash Drum Off Gas via PV-109 Bypass	MM	5		2	
4	5300	#9 DD	0004	6	17	D-5302/D-5305 Off Gas Closed Sampling System	MO	5		1	
4	5300	#9 DD	0004	7	20	C-5301C Make-up Gas Compressor Discharge PSV	S	5	PSV-153	1x2	
4	5300	#9 DD	0004	7	21	C-5301C Recycle Gas Compressor Discharge PSV	S	5	PSV-147	1.5x2.5	
4	5300	#9 DD	0004	8	24	C-5301B Make-up Gas Compressor Discharge PSV	S	5	PSV-140	1x2	
4	5300	#9 DD	0004	8	25	C-5301B Recycle Gas Compressor Discharge PSV	S	5	PSV-135	1.5x2.5	
4	5300	#9 DD	0004	9	28	C-5301A Make-up Gas Compressor Discharge PSV	S	5	PSV-132	1x2	
4	5300	#9 DD	0004	9	29	C-5301A Recycle Gas Compressor Discharge PSV	S	5	PSV-124	1.5x2.5	
4	5300	#9 DD	0004	10	30	D-5304 Make-Up Gas Comp Suction Drum PSV	S	5	PSV-160	2.5x4	
4	5300	#9 DD	0004	12	31	T-5301 Stripper PSV	S	5	PSV-217	6x8	
4	5300	#9 DD	0004	14	32	D-5306 Stripper Receiver PSV	S	5	PSV-218	3x4	
4	5300	#9 DD	0004	14	33	D-5306 Stripper Receiver Off Gas via PV-220	AO	5	PV-220	6	
4	5300	#9 DD	0004	14	34	D-5306 Stripper Receiver Off Gas via PV-220 Bypass	MM	5		6	
4	5300	#9 DD	0004	14	35	D-5306 Off Gas Closed Sampling System	MO	5		1	
4	5400	#4 PLAT	0004	1	1	D-5401 Feed Surge Drum PSV	S	7	PSV-1	6x8	
4	5400	#4 PLAT	0004	1	2	D-5401 Feed Surge Drum Off Gas via PV-2B	AO	7	PV-2B	2	
4	5400	#4 PLAT	0004	1	3	D-5401 Feed Surge Drum Off Gas via PV-2B Bypass	MM	7		2	
4	5400	#4 PLAT	0004	3	5	D-5402 High Pressure Separator PSV	S	5	PSV-68	4x6	
4	5400	#4 PLAT	0004	3	6	D-5404 Make-up Gas Comp Suction Drum PSV	S	5	PSV-90	1x2	
4	5400	#4 PLAT	0004	3	7	D-5402 High Pressure Separator Off Gas via FV-77	AO	5	FV-77	1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	5400	#4 PLAT	0004	3	8	D-5402 High Pressure Separator Off Gas via FV-77 Bypass	MM	5		1.5	
4	5400	#4 PLAT	0004	4	13	C-5401A/B/C Recycle Gas Comp Pack Vent	MO	7		1.5	
4	5400	#4 PLAT	0004	4	14	C-5401A Recycle Gas Comp MU Discharge PSV	S	5	PSV-94	1x2	
4	5400	#4 PLAT	0004	4	15	C-5401A Recycle Gas Comp Recycle Discharge PSV	S	5	PSV-100	2x3	
4	5400	#4 PLAT	0004	4	16	C-5401B Recycle Gas Comp MU Discharge PSV	S	5	PSV-105	1x2	
4	5400	#4 PLAT	0004	4	17	C-5401B Recycle Gas Comp Recycle Discharge	S	5	PSV-111	2x3	
4	5400	#4 PLAT	0004	5	20	C-5401C Recycle Gas Comp MU Discharge PSV	S	5	PSV-123	1x2	
4	5400	#4 PLAT	0004	5	21	C-5401C Recycle Gas Comp Recycle Discharge PSV	S	5	PSV-129	2x3	
4	5400	#4 PLAT	0004	6	22	T-5401 Stripper PSV	S	5	PSV-178	6x8	
4	5400	#4 PLAT	0004	6	23	T-5401 Stripper PSV	S	5	PSV-179	6x8	
4	5400	#4 PLAT	0004	6	24	T-5401 Stripper PSV	S	5	PSV-180	6x8	
4	5400	#4 PLAT	0004	7	25	D-5405 Stripper Receiver PSV	S	5	PSV-216	2.5x4	
4	5400	#4 PLAT	0004	7	26	D-5405 Stripper Receiver Off Gas via PV-188	AO	5	PV-188	1.5	
4	5400	#4 PLAT	0004	7	27	D-5405 Stripper Receiver Off Gas via PV-188 Bypass	MM	5		2	
4	5400	#4 PLAT	0005	6	29	D-5451 Platformer LP Separator PSV	S	5	PSV-375	6x10	
4	5400	#4 PLAT	0005	6	30	D-5451 Platformer LP Separator PSV	S	5	PSV-376	6x8	
4	5400	#4 PLAT	0005	6	31	D-5451 Platformer LP Separator PSV	S	5	PSV-377	6x8	
4	5400	#4 PLAT	0005	8	32	T-5451 Fractionator PSV	S	5	PSV-495	6x8	
4	5400	#4 PLAT	0005	8	33	T-5451 Fractionator PSV	S	5	PSV-496	6x8	
4	5400	#4 PLAT	0005	9	39	D-5453 Plat Fractionator Receiver PSV	S	5	PSV-541	2.5x4	
4	5400	#4 PLAT	0008	2	43	D-5459 Fuel Gas KO Drum PSV	S	5	PSV-613	4x6	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
4	5400	#4 PLAT	0008	2	44	D-5459 Fuel Gas KO Drum PSV Bypass	MM	5		1.5	
4	7907	Disulf. Wash	0028		5	D-7940 Disulfide Oil Wash Drum PSV bypass	S	7	PSV-817	2x3	
4	7907	Disulf. Wash	0028		6	D-7940 Disulfide Oil Wash Drum PSV bypass	MM	7		1.5	
5	3302	E. FG Syst.	0003	7	3	D-7939 Fuel Gas K.O. Drum PSV	S	7	PSV-461	1.5x2	
5	3302	E. FG Syst.	0003	7	4	D-7939 Fuel Gas K.O. Drum PSV Bypass	MM	7		1	
5	3302	East FG Syst	0003	7	5	D-7939 Fuel Gas KO Drum PSV	S	LP	79-PSV-461	1.5x2	
5	3302	East FG Syst	0003	7	6	D-7939 Fuel Gas KO Drum PSV bypass	MM	LP		1	
5	7300	Dimersol	0007		3	D-7318 Flushing Raffinate Drum PSV	S	LP	PSV-31	3x4	
5	7300	Dimersol	0008		6	P-7322 A Propane Seal Flush Pump Seal Vent	MM	LP		1/2"	
5	7300	Dimersol	0008		7	P-7322 A Propane Seal Flush Pump Drains	MM	LP		0.75	
5	7300	Dimersol	0008		8	P-7322 B Propane Seal Flush Pump Seal Vent	MM	LP		1/2"	
5	7300	Dimersol	0008		9	P-7322 B Propane Seal Flush Pump Drains	MM	LP		0.75	
5	7300	Dimersol	0010		14	E-7303 A 1st Pump Around Cooler Drain	MM	LP		1	
5	7300	Dimersol	0010		15	P-7304 A 1st Pump Around Train A Pump Drains	MM	LP		1	
5	7300	Dimersol	0010		16	P-7304 A 1st Pump Around Train A Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0010		17	P-7304 B 1st Pump Around Train A Pump Drains	MM	LP		1	
5	7300	Dimersol	0010		18	P-7304 B 1st Pump Around Train A Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0010		19	P-7304 C 1st Pump Around Train A Pump Drains	MM	LP		1	
5	7300	Dimersol	0010		20	P-7304 C 1st Pump Around Train A Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0010		21	E-7303A 1st Pump Around Cooler Train A PSV	S	HP	PSV-123	3x4	
5	7300	Dimersol	0010		22	R-7301A 1st Reactor Train A PSV	S	HP	PSV-109	4x6	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0010		23	R-7301A 1st Reactor Train A PSV bypass	MM	HP		4	
5	7300	Dimersol	0010		24	R-7301A 1st Reactor Train A Emergency dump HV-110	AE	HP	HV-110	6	
5	7300	Dimersol	0011		30	E-7305 A Finishing Reactor Inlet Cooler Drain	MM	LP		1	
5	7300	Dimersol	0011		31	P-7320 A Reactor Pumpout Pump Drains	MM	LP		1	
5	7300	Dimersol	0011		32	P-7320 A Reactor Pumpout Pump Seal Vent	MM	LP		0.5	
5	7300	Dimersol	0011		33	P-7320 B Reactor Pumpout Pump Drains	MM	LP		1	
5	7300	Dimersol	0011		34	P-7320 B Reactor Pumpout Pump Seal Vent	MM	LP		0.5	
5	7300	Dimersol	0011		35	P-7305 A 2nd Pumparound Pump Train A Drains	MM	LP		1	
5	7300	Dimersol	0011		36	P-7305 A 2nd Pumparound Pump Train A Disch Vent	MM	LP		1	
5	7300	Dimersol	0011		37	P-7305 B 2nd Pumparound Pump Train A Drains	MM	LP		1	
5	7300	Dimersol	0011		38	P-7305 B 2nd Pumparound Pump Train A Disch Vent	MM	LP		1	
5	7300	Dimersol	0011		39	E-7304 A 2nd P/A Cooler Train A 1st Bundle Drain	MM	LP		1	
5	7300	Dimersol	0011		40	E-7304 A 2nd P/A Cooler Train A 2nd Bundle Drain	MM	LP		1	
5	7300	Dimersol	0011		41	R-7302A 2nd Reactor Train A PSV	S	HP	PSV-125	4x6	
5	7300	Dimersol	0011		42	R-7302A 2nd Reactor Train A PSV bypass	MM	HP		4	
5	7300	Dimersol	0011		43	R-7302A 2nd Reactor Train A Emergency Dump HV-124	AE	HP	HV-124	6	
5	7300	Dimersol	0011		44	E-7304A 2nd Pump Around Cooler PSV	S	HP	PSV-138	3x4	
5	7300	Dimersol	0012		49	E-7303 B 1st Pumparound Cooler Drain	MM	LP		1	
5	7300	Dimersol	0012		50	P-7306 A 1st Pumparound Train B Pump Drains	MM	LP		1	
5	7300	Dimersol	0012		51	P-7306 A 1st Pumparound Train B Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0012		52	P-7306 B 1st Pumparound Train B Pump Drains	MM	LP		1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0012		53	P-7306 B 1st Pumparound Train B Pump Disc Vent	MM	LP		1	
5	7300	Dimersol	0012		54	P-7306 C 1st Pumparound Train B Pumps Drains	MM	LP		1	
5	7300	Dimersol	0012		55	P-7306 C 1st Pumparound Train B Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0012		56	E-7303B 1st Pumparound Cooler Train B PSV	S	HP	PSV-169	3x4	
5	7300	Dimersol	0012		57	R-7301 B 2nd Reactor Train A PSV	S	HP	PSV-155	4x6	
5	7300	Dimersol	0012		58	R-7301 B 2nd Reactor Train A PSV bypass	MM	HP		4	
5	7300	Dimersol	0012		59	R-7301 B 2nd Reactor Train A Emergency Dump HV-156	AE	HP	HV-156	6	
5	7300	Dimersol	0013		63	E-7305B Finishing Reactor Inlet Cooler Drain	MM	LP		1	
5	7300	Dimersol	0013		64	E-7304 B 2nd P/A Cooler Train B 1st Bundle Drain	MM	LP		1	
5	7300	Dimersol	0013		65	E-7304 B 2nd P/A Cooler Train B 2nd Bundle Drain	MM	LP		1	
5	7300	Dimersol	0013		66	P-7307 A 2nd Pumparound Pump Drain	MM	LP		1	
5	7300	Dimersol	0013		67	P-7307 B 2nd Pumparound Pump Drain	MM	LP		1	
5	7300	Dimersol	0013		68	P-7307 A 2nd Pumparound Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0013		69	P-7307 B 2nd Pumparound Pump Disch Vent	MM	LP		1	
5	7300	Dimersol	0013		70	R-7303 Finishing Reactor PSV	S	HP	PSV-196B	4x6	
5	7300	Dimersol	0013		71	R-7303 Finishing Reactor PSV bypass	MM	HP		4	
5	7300	Dimersol	0013		72	R-7303 Finishing Reactor PSV	S	HP	PSV-196A	6x8	
5	7300	Dimersol	0013		73	R-7303 Finishing Reactor PSV bypass	MM	HP		4	
5	7300	Dimersol	0013		74	E-7304 B 2nd Pumparound Cooler Train B PSV	S	HP	PSV-187	3x4	
5	7300	Dimersol	0013		75	R-7302 B 2nd Reactor Train B PSV	S	HP	PSV-174	4x6	
5	7300	Dimersol	0013		76	R-7302 B 2nd Reactor Train B PSV bypass	MM	HP		4	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0013		77	R-7302 B 2nd Reactor Train B Emergency Dump HV-173	AE	HP	HV-173	6	
5	7300	Dimersol	0014		79	D-7306 Ammonia Mix Drum Vent	MM	LP		1.5	
5	7300	Dimersol	0014		80	D-7306 Ammonia Mix Drum PSV	S	HP	PSV-218	2x3	
5	7300	Dimersol	0014		81	D-7306 Ammonia Mix Drum PSV bypass	MM	HP		1.5	
5	7300	Dimersol	0015		84	D-7307 Caustic Wash Drum PSV	S	HP	PSV-227	3x4	
5	7300	Dimersol	0015		85	D-7307 Caustic Wash Drum PSV bypass	MM	HP		3	
5	7300	Dimersol	0016		88	D-7308 Water Washing Drum PSV	S	HP	PSV-243	3x4	
5	7300	Dimersol	0016		89	D-7308 Water Washing Drum PSV bypass	MM	HP		3	
5	7300	Dimersol	0017		95	D-7310 Stabilizer Feed/Coalescer Drain	MM	LP		1.5	
5	7300	Dimersol	0017		96	P-7312 A Stabilizer Feed Pump Drains	MM	LP		1	
5	7300	Dimersol	0017		97	P-7312 B Stabilizer Feed Pump Drains	MM	LP		1	
5	7300	Dimersol	0017		98	D-7310 Stabilizer Feed Filter/Coalescer PSV	S	HP	PSV-280	1.5x2	
5	7300	Dimersol	0017		99	D-7309 Stabilizer Surge Drum PSV	S	HP	PSV-266	2x3	
5	7300	Dimersol	0018		103	E-7306 C/D Stabilizer Feed/Btms Exch. Shell PSV	S	LP	PSV-295	3x4	
5	7300	Dimersol	0018		104	E-7306 A/B Stabilize Feed/Btms Exch Shell PSV	S	LP	PSV-289	3x4	
5	7300	Dimersol	0019		110	E-7308 B Stabilizer Reboiler PSV	S	HP	PSV-315	2x3	
5	7300	Dimersol	0019		111	E-7308 B Stabilizer Reboiler PSV bypass	MM	HP		1.5	
5	7300	Dimersol	0019		112	T-7301 Stabilizer PSV	S	HP	PSV-318	3x4	
5	7300	Dimersol	0019		113	E-7308 A Stabilizer Reboiler PSV	S	HP	PSV-314	2x3	
5	7300	Dimersol	0019		114	E-7308 A Stabilizer Reboiler PSV bypass	MM	HP		1.5	
5	7300	Dimersol	0020		125	P-7316 A Stabilizer Reflux Pump Drains	MM	LP		1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0020		126	P-7316 B Stabilizer Reflux Pump Drains	MM	LP		1	
5	7300	Dimersol	0020		127	P-7315 A Stabilizer Distillate Pump Drains	MM	LP		1	
5	7300	Dimersol	0020		128	P-7315 A Stabilizer Distillate Pump Seal Vent	MM	LP		0.5	
5	7300	Dimersol	0020		129	P-7315 B Stabilizer Distillate Pump Drains	MM	LP		1	
5	7300	Dimersol	0020		130	P-7315 B Stabilizer Distillate Pump Seal Vent	MM	LP		0.5	
5	7300	Dimersol	0020		131	E-7309 Stabilizer Condenser Drain	MM	LP		1	
5	7300	Dimersol	0020		132	E-7309 Stabilizer Condenser Vent	MM	LP		1.5	
5	7300	Dimersol	0020		133	D-7312 Propane Product Filter/Coalescer Drain	MM	LP		1.5	
5	7300	Dimersol	0020		134	D-7311 Stabi. Reflux Drum Offgas via PDV-341B Bypass	MM			1.5	
5	7300	Dimersol	0020		135	D-7311 Stabilizer Reflux Drum PSV	S	HP	PSV-342	1.5x3	
5	7300	Dimersol	0020		136	D-7312 Propane Product Filter/Coalescer PSV	S	HP	PSV-354	1.5x2	
5	7300	Dimersol	0021		139	E-7310 Propane Drier Steam Heater Tube Vent	MM	LP		1.5	
5	7300	Dimersol	0021		140	D-7313 A/B Propane Drier Vent	MM	LP		1.5	
5	7300	Dimersol	0021		141	D-7313 A/B Propane Drier Vent	MM	LP		1.5	
5	7300	Dimersol	0021		142	E-7311 Propane Drier Outlet PSV	S	HP	PSV-373	1.5x2.5	
5	7300	Dimersol	0021		143	E-7311 Propane Drier Outlet PSV bypass	MM	HP		1.5	
5	7300	Dimersol	0021		144	D-7313 B Propane Drier PSV	S	HP	PSV-378	2x3	
5	7300	Dimersol	0021		145	D-7313 A Propane Drier PSV	S	HP	PSV-377	2x3	
5	7300	Dimersol	0022		147	D-7316 Caustic Degassing Drum PSV	S	LP	PSV-401	1.5x2	
5	7300	Dimersol	0022		148	D-7316 Caustic Degas. Drum Offgas via PV-400A bypass	MM	LP		1.5	
5	7300	Dimersol	0024		149	D-7305 Ammonia Storage PSV	S	LP	PSV-204A	2x3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7300	Dimersol	0024		150	D-7306 Ammonia Storage PSV	S	LP	PSV 204B	2x3	
5	7300	Dimersol	0024		151	D-7306 Ammonia Storage PSV bypass	MM	LP		2	
5	7300	Dimersol	0045	1	152	High Pressure to Low Pressure Crossover	MM	HP / LP		8	
5	7300	Dimersol	0045	1	153	High Pressure to Low Pressure Crossover	MM	HP / LP		30	
5	7450	Amine Reg.#6	0006		10	D-7458 Sponge Gas KO Drum Instr Drains	MM	LP		1	
5	7450	Amine Reg.#6	0006		11	D-7457 Fuel Gas KO Drum Offgas via PV-5011 bypass	MM			10	
5	7450	Amine Reg.#6	0006		12	T-7450 Fuel Gas Amine Absorber PSV	S	HP	PSV-5012	4x6	
5	7450	Amine Reg.#6	0006		13	D-7458 Sponge Gas KO Drum PSV	S	HP	PSV-5001	4x6	
5	7450	Amine Reg.#6	0007		20	D-7452 Rich Amine Flash Drum PSV	S	LP	PSV-5021	3x4	
5	7450	Amine Reg.#6	0008		24	F-7451 Amine Cartridge Filter No. 1 PSV	S	LP	PSV-5051	1x2	
5	7450	Amine Reg.#6	0008		25	S-7453 Amine Carbon Filter PSV	S	LP	PSV-5055	1x2	
5	7450	Amine Reg.#6	0008		26	S-7453 Amine Carbon Filter bypass	MM	LP		1	
5	7450	Amine Reg.#6	0008		27	D-7453 Amine Storage Drum PSV	S	LP	PSV-5185	3x4	
5	7450	Amine Reg.#6	0008		28	D-7453 Amine Storage Drum PSV bypass	MM	LP		2	
5	7450	Amine Reg.#6	0009		32	F-7453 Amine Sump Filter PSV	S	LP	PSV-5209	1x2	
5	7450	Amine Reg.#6	0009		33	F-7452 Amine Cartridge Filter No. 2 PSV	S	LP	PSV-5208	1x2	
5	7450	Amine Reg.#6	0010		34	T-7451 Amine Regenerator PSV	S	LP	PSV-5094	4x6	
5	7450	Amine Reg.#6	0010		35	T-7451 Amine Regenerator PSV bypass	MM	LP		3	
5	7450	Amine Reg.#6	0010		36	E-7452 A Amine Regenerator Reboiler Shell PSV	S	LP	PSV-5102	1.5x 2.5	
5	7450	Amine Reg.#6	0010		37	E-7452 A Amine Regenerator Reboiler Shell PSV bypass	MM	LP		1.5	
5	7450	Amine Reg.#6	0010		38	E-7452 B Amine Regenerator Reboiler Shell PSV	S	LP	PSV-5111	1.5x 2.5	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7450	Amine Reg.#6	0010		39	E-7452 B Amine Regenerator Reboiler Shell PSV bypass	MM	LP		1	
5	7450	Amine Reg.#6	0011		43	D-7451 Amine Regen. Reflux Drum OFF GAS via PV-5139	AO		PV-5139	8	
5	7450	Amine Reg.#6	0011		44	D-7451 Amine Regen.Reflux Drum Offgas via PV-5139 bypasss	MM			8	
5	7450	Amine Reg.#6	0011		45	D-7451 Amine Regenerator Reflux Drum PSV	S	LP	PSV-5126	1.5x2	
5	7450	Amine Reg.#6	0011		46	D-7451 Amine Regenerator Reflux Drum PSV bypass	MM	LP		1.5	
5	7450	Amine Reg.#6	0011		47	E-7451 Amine Regenerator Ovhd Condenser Drains	MM	LP		1	
5	7450	Amine Reg.#6	0012		48	E-7455 Amine Reclaimer PSV	S	LP	PSV-5243	3x4	
5	7450	Amine Reg.#6	0012		49	E-7455 Amine Reclaimer PSV bypass	MM	LP		4	
5	7450	Amine Reg.#6	0013		51	D-7462 Vacuum Pump KO Drum PSV	S	LP	PSV-5258	1x2	
5	7450	Amine Reg.#6	0013		52	D-7462 Vacuum Pump KO Drum PSV bypass	MM	LP		1.5	
5	7450	Amine Reg.#6	0013		53	D-7460 Amine Reclaimer Separator OFF GAS	MO			1.5	
5	7450	Amine Reg.#6	0013		54	D-7460 Amine Reclaimer Separator PSV	S	LP	PSV-5257	1x2	
5	7450	Amine Reg.#6	0013		55	D-7460 Amine Reclaimer Separator PSV bypass	MM	LP		1.5	
5	7460	Amine Reg.#7	0007		7	F-7461 Amine Cartridge Filter No. 1 PSV	S	LP	PSV-6020	1x2	
5	7460	Amine Reg.#7	0007		8	F-7462 Amine Cartridge Filter No. 2 PSV	S	LP	PSV-6021	1x2	
5	7460	Amine Reg.#7	0007		9	S-7463 Amine Carbon Filter PSV	S	LP	PSV-6027	1x2	
5	7460	Amine Reg.#7	0008		10	T-7461 Amine Regenerator PSV	S	LP	PSV-6048	4x6	
5	7460	Amine Reg.#7	0008		11	T-7461 Amine Regenerator PSV bypass	MM	LP		3	
5	7460	Amine Reg.#7	0011		17	D-7461 Amine Regen. Reflux Drum OFF GAS via PV-6049	AO		PV-6049	10	
5	7460	Amine Reg.#7	0011		18	D-7461 Amine Regen.Reflux Dr Offgas via PV-6049 bypasss	MM			10	
5	7460	Amine Reg.#7	0011		19	D-7461 Amine Regenerator Reflux Drum PSV	S	LP	PSV-6068	1.5x3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7460	Amine Reg.#7	0011		20	E-7461 Amine Regenerator Ovhd Condenser Drains	MM	LP		1	
5	7500	LPG Merox	0007		4	D-7508 LPG Sand Filter PSV	S	HP	PSV-30	4x6	
5	7500	LPG Merox	0007		5	D-7518 Caustic K O Drum PSV	S	HP	PSV-22	3x4	
5	7500	LPG Merox	0009		8	D-7510 Disulfide/Naphtha Sand Filter PSV	S	LP	PSV-67	1.5x2.5	
5	7500	LPG Merox	0009		9	D-7504 Wash/Naphtha Settler PSV	S	HP	PSV-63	2x3	
5	7500	LPG Merox	0010		11	D-7502 Disulfide Separator Off Gas via PV-75	AO		PV-75	1	
5	7500	LPG Merox	0010		12	D-7502 Disulfide Separator Off Gas via PV-75 bypass	MM			1.5	
5	7500	LPG Merox	0010		13	D-7502 Disulfide Separator PSV	S	LP	PSV-71	4x6	
5	7500	LPG Merox	0006A		18	T-7501 LPG Amine Absorber PSV	S	HP	PSV-3	3x4	
5	7500	LPG Merox	0006A		19	D-7519 R Amine Coalescer PSV	S	HP	PSV-174R	3x4	
5	7500	LPG Merox	0006B		24	D-7501 Caustic Prewash PSV	S	HP	PSV-9	3x4	
5	7500	LPG Merox	0006B		25	T-7502 LPG Extractor PSV	S	HP	PSV-014	3x4	
5	7550	LCN Merox	0006		4	D-7551 LCN Caustic Settler PSV	S	LP	PSV-5007	6x8	
5	7550	LCN Merox	0007		7	R-7551 LCN Merox Reactor PSV	S	LP	PSV-5020	4x6	
5	7550	LCN Merox	0009		10	D-7554 Vent Gas Separator Off Gas via PV-5038	AO		PV-5038	1	
5	7550	LCN Merox	0009		11	D-7554 Vent Gas Separator Off Gas via PV-5038 bypass	MM			1	
5	7550	LCN Merox	0009		12	D-7554 Vent Gas Separator PSV	S	LP	PSV-5037	2x3	
5	7570	HCN Merox	0007		4	R-7571 Merox Reactor PSV	S	HP	PSV-7014	3x4	
5	7570	HCN Merox	0008		9	D-7573 HCN Degas. Drum Off Gas via LV & PV-7020	AO		LV&PV-7020	2	
5	7570	HCN Merox	0008		10	D-7573 HCN Degassing Drum PSV	S	HP	PSV-7019	2.5x4	
5	7590	C5 Merox	0006		5	T-7591 C5 Extractor PSV	S	HP	PSV-9005	2x3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7590	C5 Merox	0006		6	D-7591 C5/Caustic K O Drum PSV	S	HP	PSV-9010	3x4	
5	7590	C5 Merox	0006		7	D-7592 C5 Sand Filter PSV	S	HP	PSV-9014	2x3	
5	7600	Sel Hydrogen.	0007		5	T-7601 Water Wash Tower Ovhd Vent	MM	LP		1.5	
5	7600	Sel Hydrogen.	0007		6	T-7601 Water Wash Tower PSV	S	HP	PSV-8	4x6	
5	7600	Sel Hydrogen.	0008		20	D-7601 Feed Coalescer/ Surge Drum Offgas via PV-20B bypass	MM			2	
5	7600	Sel Hydrogen.	0008		21	D-7601 Feed Coalescer / Surge Drum PSV	S	HP	PSV-19	4x6	
5	7600	Sel Hydrogen.	0009		27	E-7602 Reactor Feed Trim Heater PSV	S	HP	PSV-320	1x2	
5	7600	Sel Hydrogen.	0009		28	E-7601 B Reactor Feed / Effluent Exch. PSV	S	HP	PSV-321	1x2	
5	7600	Sel Hydrogen.	0011		29	D-7602 C3/C4 Splitter Rec'r Offgas via PDV-78B bypass	MM			2	
5	7600	Sel Hydrogen.	0011		30	D-7602 C3/C4 Splitter Rec'r Offgas via PV-20A bypass	MM			3	
5	7600	Sel Hydrogen.	0012		38	E-7603 C C3/C4 Splitter Feed / Btms Exch.Shell PSV	S	HP	PSV-202	1x2	
5	7600	Sel Hydrogen.	0012		39	T-7602 C3/C4 Splitter PSV	S	HP	PSV-62	4x6	
5	7600	Sel Hydrogen.	0012		40	T-7602 C3/C4 Splitter PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0012		41	T-7602 C3/C4 Splitter PSV	S	HP	PSV-63	4x6	
5	7600	Sel Hydrogen.	0012		42	T-7602 C3/C4 Splitter PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0012		43	E-7605 B C3/C4 Splitter Reboiler PSV	S	HP	PSV-128	4x6	
5	7600	Sel Hydrogen.	0012		44	E-7605 B C3/C4 Splitter Reboiler PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0012		45	E-7605 B C3/C4 Splitter Reboiler PSV	S	HP	PSV-129	4x6	
5	7600	Sel Hydrogen.	0012		46	E-7605 A C3/C4 Splitter Reboiler PSV	S	HP	PSV-127	4x6	
5	7600	Sel Hydrogen.	0012		47	E-7605 A C3/C4 Splitter Reboiler PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0012		48	E-7605 A C3/C4 Splitter Reboiler PSV	S	HP	PSV-126	4x6	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7600	Sel Hydrogen.	0013		57	E-7606 C3/C4 Splitter Reboiler PSV	S	HP	PSV-131	4x6	
5	7600	Sel Hydrogen.	0013		58	E-7606 C3/C4 Splitter Reboiler PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0013		59	E-7606 C3/C4 Splitter Reboiler PSV	S	HP	PSV-130	4x6	
5	7600	Sel Hydrogen.	0013		60	D-7602 C3/C4 Splitter Receiver PSV	S	HP	PSV-82	3x4	
5	7600	Sel Hydrogen.	0013		61	D-7602 C3/C4 Splitter Receiver PSV bypass	MM	HP		2	
5	7600	Sel Hydrogen.	0014		75	D-7612 Dimersol Feed Coalescer PSV	S	HP	PSV-250	1.5x2	
5	7600	Sel Hydrogen.	0017		81	E-7617 Regen Gas Cooler Hdr Vent	MM	LP		1	
5	7600	Sel Hydrogen.	0017		82	E-7617 Regen Gas Cooler Hdr Drain	MM	LP		1	
5	7600	Sel Hydrogen.	0017		83	S-7603 Dimersol Feed Drier Regeneration Heater PSV	S	HP	PSV-176	2.5x4	
5	7600	Sel Hydrogen.	0017		84	D-7607 A Dimersol Feed Drier PSV	S	HP	PSV-144	2.5x4	
5	7600	Sel Hydrogen.	0017		85	D-7607B Dimersol Feed Drier PSV	S	HP	PSV-155	2.5x4	
5	7600	Sel Hydrogen.	0017		86	E-7611 Dimersol Feed Drier Tube Side Drain	MM	LP		1.5	
5	7600	Sel Hydrogen.	0018		87	D-7618 Butane Drier Feed Coalescer PSV	S	LP	PSV-325	1.5x2.5	
5	7600	Sel Hydrogen.	0018		88	D-7618 Butane Drier Feed Coalescer PSV bypass	MM	LP		1.5	
5	7600	Sel Hydrogen.	0018		89	D-7618 Butane Drier Feed Coalescer Drain & Instrs	MM	LP		1.5	
5	7600	Sel Hydrogen.	0018		90	D- 7619 A Butane Drier Vent	MM	LP		1.5	
5	7600	Sel Hydrogen.	0018		91	D- 7619 B Butane Drier Vent	MM	LP		1.5	
5	7600	Sel Hydrogen.	0018		92	D-7619 A Butane Drier PSV	S	HP	PSV-348	2.5x4	
5	7600	Sel Hydrogen.	0018		93	D-7619 A Butane Drier PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0018		94	D-7619 B Butane Drier PSV	S	HP	PSV-349	2.5x4	
5	7600	Sel Hydrogen.	0018		95	D-7619 B Butane Drier PSV bypass	MM	HP		3	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
5	7600	Sel Hydrogen.	0019		102	S-7605 Butane Drier Regeneration Heater PSV	S	LP	PSV-359	2.5x4	
5	7600	Sel Hydrogen.	0019		103	S-7605 Butane Drier Regeneration Heater PSV bypass	MM	LP		3	
5	7600	Sel Hydrogen.	0019		104	E-7615 Butane Drier Regeneration Steam Heater Drain	MM	LP		1.5	
5	7600	Sel Hydrogen.	0019		105	P-7610 A Butane Regen Recycle Pump Disch Vent	MM	LP		1	
5	7600	Sel Hydrogen.	0019		106	P-7610 A Butane Regen Recycle Pump Suct Drain	MM	LP		1	
5	7600	Sel Hydrogen.	0019		107	P-7610 A Butane Regen Recycle Pump Casing Vent	MM	LP		3/4"	
5	7600	Sel Hydrogen.	0019		108	P-7610 B Butane Regen Recycle Pump Disch Vent	MM	LP		1	
5	7600	Sel Hydrogen.	0019		109	P-7610 B Butane Regen Recycle Pump Suct Drain	MM	LP		1	
5	7600	Sel Hydrogen.	0019		110	P-7610 B Butane Regen Recycle Pump Casing Vent	MM	LP		3/4"	
5	7600	Sel Hydrogen.	0019		111	D-7617 Butane Regeneration Separator PSV	S	HP	PSV-383	2.5x4	
5	7600	Sel Hydrogen.	0019		112	D-7617 Butane Regeneration Separator PSV bypass	MM	HP		3	
5	7600	Sel Hydrogen.	0045	1	113	High Pressure to Low Pressure Crossover	MM	HP / LP		8	
5	7600	Sel Hydrogen.	0045	1	114	High Pressure to Low Pressure Crossover	MM	HP / LP		30	
5	7600	Sel Hydrogen.	0010A		122	D-7605 Hydrogen Separator PSV	S	HP	PSV-41	1.5x2	
5	7600	Sel Hydrogen.	0010A		123	D-7605 Hydrogen Separator PSV bypass	MM	HP		1.5	
5	7600	Sel Hydrogen.	0010A		124	R-7601 Selective Hydrogenation Reactor PSV	S	HP	PSV-54	2.5x4	
5	7600	Sel Hydrogen.	0010B		126	R-7604 Selective Hydrogenation Reactor PSV	S	HP	PSV-569	2.5x4	
5	7904	FCC Interconn	0008		1	Tempurge FG to LP Flare (from FCC) via FV-4071	AE	LP	FV-4071	2	
5	7904	FCC Interconn	0008		2	Tempurge FG to LP Flare via FV-4075	AE	LP	FV-4075	2	
5	7904	FCC Interconn	0021		5	D-7937 Vent Gas KO Drum Off Gas via XV-456	AO		XV-456	6	
5	7904	FCC Interconn	0021		6	D-7937 Vent Gas KO Drum PSV	S	LP	PSV-460	1.5x2	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	1070	#6 SWS	0008		3	T-1071 Sour Water Stripper PSV	S	3	PSV-34	3x4	
6	1070	#6 SWS	0008		4	T-1071 Sour Water Stripper Off Gas	AO	3		10	
6	1070	#6 SWS	0008		5	T-1071 SW Stripper Off Gas via PV-30B bypass	MM	3		6	
6	1070	#6 SWS	0010		8	TK-1072 SCH Collection Tank Vent	O			12	
6	1070	#6 SWS	0010		9	P-1075 A SCH Collection Pump Disch Vent	O			1.5	
6	1600	Benzene VR	0002	4	1	D-1652 Incinerator Seal Drum PSV	S	5/7	PSV-401	1x2	
6	1600	Benzene VR	0002	4	2	D-1652 Incinerator Seal Drum PSV bypass	MM	5/7		1.5	
6	3300	E Proc Intercon.	0003	29	1	Acid Gas Header Pressure Control Valve	AE	5/7	PV-4712	8	
6	3300	E Proc Intercon.	0003	29	2	Acid Gas Header Pressure Control Valve Bypass	MM	5/7		10	
6	3300	E Proc Intercon.	0003	29	3	Acid Gas Header Pressure Control Valve	AE	5/7	PV-4713	3	
6	3300	E Proc Intercon.	0003	29	4	Acid Gas Header Pressure Control Valve Bypass	MM	5/7		4	
6	4720	#3 SWS	0003	2	2	T-4723 Oil Skimming Drum PSV	S	7	PSV-3537	1.5 x 3	
6	4720	#3 SWS	0003	2	3	T-4723 Oil Skimming Drum PSV bypass	MM	7		2	
6	4720	#3 SWS	0003	3	4	T-4724 HC Sump PVSV	S		PVSV-2745	2x2	
6	4720	#3 SWS	0003	6	5	T-4721 Sour Water Stripper Off Gas	MO	7			
6	4720	#3 SWS	0003	6	6	T-4721 Sour Water Stripper PSV	S	7	PSV-2536A	3x4	
6	4720	#3 SWS	0003	6	7	T-4721 Sour Water Stripper PSV Bypass	MM	7		1	
6	4720	#3 SWS	0003	6	8	T-4721 Sour Water Stripper PSV-2536A Vent	S			0.5	
6	4730	#4 SWS	0003	2	1	T-4731 Sour Water Stripper Off Gas	MO	7			
6	4730	#4 SWS	0003	2	2	T-4731 Sour Water Stripper PSV	S	7	PSV-3536A	3x4	
6	4730	#4 SWS	0003	2	3	T-4731 Sour Water Stripper PSV bypass	MM	7		1	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	4730	#4 SWS	0003	2	4	T-4731 Sour Water Stripper PSV-3536A Vent	S			0.5	
6	4740	#3 SRU	0003	1	3	T-4741 Clean Acid Gas K O Drum Off Gas	MO, AO				
6	4740	#3 SRU	0003	1	4	T-4741 Clean Acid Gas K O Drum PSV	S	5,7	PSV-4625	1x2	
6	4740	#3 SRU	0003	1	5	T-4742 NH3 Acid Gas K O Drum Off Gas	MO, AO			6	
6	4740	#3 SRU	0003	1	6	T-4742 NH3 Acid Gas K O Drum PSV	S	5,7	PSV-4626	1 x2	
6	4750	#4 SRU	0003	1	3	T-4751 Clean Acid Gas K O Drum Off Gas	MO, AO				
6	4750	#4 SRU	0003	1	4	T-4751 Clean Acid Gas K O Drum PSV	S	7	PSV-5625	1x2	
6	4750	#4 SRU	0003	1	5	T-4752 NH3 Acid Gas K O Drum Off Gas	MO, AO			6	
6	4750	#4 SRU	0003	1	6	T-4752 NH3 Acid Gas K O Drum PSV	S	7	PSV-5626	1 x2	
6	4760	#2 Beavon	0003	1	3	D-4766 Propane Gas KO Drum PSV	S	5	PSV-6902	1x1	
6	4760	#2 Beavon	0003	1	4	D-4766 Propane Gas KO Drum PSV Bypass	MM	5		2	
6	4760	#2 Beavon	0003	1	5	E-4766 Propane Vaporizer Tube Outlet PSV	S	5	PSV-6901	1x2	
6	4760	#2 Beavon	0003	4	6	C-4763A/B/C Abs. Exhaust Blower Disch via PV-6543	AO		PV-6543	20	
6	7400	#5 SWS	0008		3	E-7402 A SWS Reboiler PSV	S	7	PSV-70	3x4	
6	7400	#5 SWS	0008		4	E-7402 A SWS Reboiler PSV bypass	MM	7		2	
6	7400	#5 SWS	0008		5	E-7402 B SWS Reboiler PSV	S	7	PSV-71	3x4	
6	7400	#5 SWS	0008		6	E-7402 B SWS Reboiler PSV bypass	MM	7		2	
6	7400	#5 SWS	0008		7	T-7401 Sour Water Stripper PSV	S	7	PSV-34	3x4	
6	7400	#5 SWS	0008		8	T-7401 Sour Water Stripper Off Gas	AO	7		10	
6	7400	#5 SWS	0008		9	T-7401 SW Stripper Off Gas via PV-30B bypass	MM	7		4	
6	7400	#5 SWS	0009		12	TK-7482 SCH Collection Tank Vent	O			12	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	7400	#5 SWS	0009		13	P-7406 A SCH Collection Pump Disch Vent	O			1.5	
6	7907	Rundown/Tk	0026		1	Butane To/From Cold Storage PSV	S	LPG	PSV-985	1x1	
6	7920	Refri LPG Stg	0006		1	E-7921 Product Chiller Evap. Cooler Vent Gas	MM	LPG		1	
6	7920	Refri LPG Stg	0006		2	E-7921 Product Chiller Evap. Cooler PSV	S	LPG	PSV-2010	1.5x2	
6	7920	Refri LPG Stg	0006		3	E-7921 Product Chiller Evap. Cooler PSV	S	LPG	PSV-2009	2x3	
6	7920	Refri LPG Stg	0006		4	E-7921 Product Chiller Evap. Cooler PSV bypass	MM	LPG		1.5	
6	7920	Refri LPG Stg	0006		5	E-7921 Product Chiller Evap. Cooler Level Inst Drains	MM	LPG		1	
6	7920	Refri LPG Stg	0006		6	E-7921 Product Chiller Evap. Cooler Drain	MM	LPG		1.5	
6	7920	Refri LPG Stg	0006		7	E-7921 Product Chiller Evap. Cooler PSV	S	LPG	PSV-2241	2x3	
6	7920	Refri LPG Stg	0006		8	LPG from Refinery bypass (Feed/Flare Jump Over)	MM	LPG		2	
6	7920	Refri LPG Stg	0007		11	Ship Offloading PSV	S	LPG	PSV-2017	1.5x3	
6	7920	Refri LPG Stg	0007		12	Tk-7921 LPG Storage Pressure Control via PV-2030C	AE	LPG	PV-2030C	16	
6	7920	Refri LPG Stg	0007		13	Tk-7921 LPG Storage Vent via PV-2030C bypass	MM	LPG		16	
6	7920	Refri LPG Stg	0008		16	P-7921 A Loadout Pump Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0008		17	P-7921 A Loadout Pump Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0008		18	P-7921 A Loadout Pump Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0008		19	P-7921 B Loadout Pump Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0008		20	P-7921 B Loadout Pump Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0008		21	P-7921 B Loadout Pump Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0008		22	Tk-7921 LPG Storage Tank to Loadout Pump A PSV	S	LPG	PSV-2066	1.5x2	
6	7920	Refri LPG Stg	0008		23	Tk-7921 LPG Storage Tank to Loadout Pump B PSV	S	LPG	PSV-2073	1.5x2	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	7920	Refri LPG Stg	0009		27	P-7921 C Loadout Pump Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0009		28	P-7921 C Loadout Pumps Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0009		29	P-7921 C Loadout Pumps Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0009		30	P-7922 A Transfer Pumps Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0009		31	P-7922 A Transfer Pumps Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0009		32	P-7922 A Transfer Pumps Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0009		33	Tk-7921 LPG Storage Tank to Transfer Pump A PSV	S	LPG	PSV-2087	1x2	
6	7920	Refri LPG Stg	0009		34	Tk-7921 LPG Storage Tank to Load Up Pump C PSV	S	LPG	PSV-2081	1.5x2	
6	7920	Refri LPG Stg	0009		35	P-7921 A/B/C Loadout Pump Outlet PSV	S	LPG	PSV-2079	1.5x3	
6	7920	Refri LPG Stg	0010		38	P-7922 B Transfer Pumps Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0010		39	P-7922 B Transfer Pumps Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0010		40	P-7922 B Transfer Pumps Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0010		41	P-7922 C Transfer Pumps Casing Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0010		42	P-7922 C Transfer Pumps Suct Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0010		43	P-7922 C Transfer Pumps Disch Vent	MM	LPG		1	
6	7920	Refri LPG Stg	0010		44	Tk-7921 LPG Storage Tank to Transfer Pump B PSV	S	LPG	PSV-2094	1x2	
6	7920	Refri LPG Stg	0010		45	Tk-7921 LPG Storage Tank to Transfer Pump C PSV	S	LPG	PSV-2099	1x2	
6	7920	Refri LPG Stg	0011		48	P-7922 A/B/C Transfer Pump PSV	S	LPG	PSV-2255	1x2	
6	7920	Refri LPG Stg	0011		49	P-7922 A/B/C Transfer Pump PSV	S	LPG	PSV-2109	1x2	
6	7920	Refri LPG Stg	0011		50	E-7923 Product Heater Drain	MM	LPG		1.5	
6	7920	Refri LPG Stg	0011		51	E-7923 Product Heater Instr Drain	MM	LPG		1	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	7920	Refri LPG Stg	0011		52	E-7922 Process Heater PSV	S	LPG	PSV-2113	4x6	
6	7920	Refri LPG Stg	0011		53	E-7922 Process Heater PSV bypass	MM	LPG		3	
6	7920	Refri LPG Stg	0012		54	C-7921 B Boil Off Compressor PSV	S	LPG	PSV-2270	1.5x3	
6	7920	Refri LPG Stg	0012		55	C-7921 B Boil Off Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0012		56	C-7921 A Boil Off Compressor PSV	S	LPG	PSV-2269	1.5x3	
6	7920	Refri LPG Stg	0012		57	C-7921 A Boil Off Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0013		61	C-7921 C Boil Off Compressor PSV	S	LPG	PSV-2268	1.5x3	
6	7920	Refri LPG Stg	0013		62	C-7921 C Boil Off Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0013		63	D-7922 Boil Off Receiver Vent	MM	LPG		1.5	
6	7920	Refri LPG Stg	0013		64	D-7922 Boil Off Receiver Drain	MM	LPG		1.5	
6	7920	Refri LPG Stg	0013		65	D-7922 Boil Off Receiver Instr. Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0013		66	D-7922 Boil Off Receiver PSV	S	LPG	PSV-2176	2x3	
6	7920	Refri LPG Stg	0013		67	D-7922 Boil Off Receiver PSV bypass	MM	LPG		1.5	
6	7920	Refri LPG Stg	0013		68	E-7925 Purger PSV	S	LPG	PSV-2181	1x2	
6	7920	Refri LPG Stg	0013		69	E-7925 Purger PSV	S	LPG	PSV-2183	1x2	
6	7920	Refri LPG Stg	0014		70	C-7922 B Refrigerant Compressor PSV	S	LPG	PSV-2375	2x3	
6	7920	Refri LPG Stg	0014		71	C-7922 B Refrigerant Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0014		72	C-7922 A Refrigerant Compressor PSV	S	LPG	PSV-2271	2x3	
6	7920	Refri LPG Stg	0014		73	C-7922 A Refrigerant Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0015		74	D-7923 Refrigerant Receiver PSV	S	LPG	PSV-2228	1.5x3	
6	7920	Refri LPG Stg	0015		75	D-7923 Refrigerant Receiver PSV bypass	MM	LPG		1.5	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
6	7920	Refri LPG Stg	0015		76	D-7923 Refrigerant Receiver Drain	MM	LPG		1.5	
6	7920	Refri LPG Stg	0015		77	D-7923 Refrigerant Receiver Instr. Drain	MM	LPG		1	
6	7920	Refri LPG Stg	0015		78	D-7923 Refrigerant Receiver Vent	MM	LPG		1.5	
6	7920	Refri LPG Stg	0015		79	E-7926 Refrigerant Condenser Vent	MM	LPG		1.5	
6	7920	Refri LPG Stg	0015		80	C-7922 C Refrigerant Compressor PSV	S	LPG	PSV-2272	2x3	
6	7920	Refri LPG Stg	0015		81	C-7922 C Refrigerant Compressor PSV bypass	MM	LPG		1	
6	7920	Refri LPG Stg	0021		82	Cargo to/from Refrig Storage transfer line PSV	S	LPG	PSV-471	1x1	
6	7920	Refri LPG Stg	0021		83	Cooldown Liquid from Refrig Storage transfer line PSV	S	LPG	PSV-472	1x1	
6	7940	Flare	0006		4	Fuel Gas to Flare - Tempurge via XV-4067	AE	LP	XV-4067	2	
7	8500	DELAYED COKER	113		43	T-8501 Coker Fractionator Ovhd PSV	S	LP	PSV-1172	8x10	
7	8500	DELAYED COKER	113		44	T-8501 Coker Fractionator Ovhd PSV	S	LP	PSV-1173	8x10	
7	8500	DELAYED COKER	113		45	T-8501 Coker Fractionator Ovhd PSV	S	LP	PSV-1175	8x10	
7	8500	DELAYED COKER	113		46	T-8501 Coker Fractionator Ovhd PSV	S	LP	PSV-1190	8x10	
7	8500	DELAYED COKER	113		47	T-8501 Coker Fractionator Ovhd PSVs' bypass	MM	LP		6	
7	8500	DELAYED COKER	114		48	E-8551A Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		49	E-8551A Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		50	E-8551B Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		51	E-8551B Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		52	E-8551C Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		53	E-8551C Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	114		54	E-8551D Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	114		55	E-8551D Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		56	E-8551E Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		57	E-8551E Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		58	E-8551F Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		59	E-8551F Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		60	E-8551G Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		61	E-8551G Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		62	E-8551H Fractioantor Ovhd Cond. Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	115		63	E-8551H Fractioantor Ovhd Cond. Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	116		67	D-8505 Fractionator Ovhd Drum Off Gas via PV-1308 bypass	MM	LP		16	
7	8500	DELAYED COKER	116		68	D-8505 Fractionator Ovhd Drum PSV	S	LP	PSV-1309	8x10	
7	8500	DELAYED COKER	116		69	D-8505 Fractionator Ovhd Drum PSV	S	LP	PSV-1321	8x10	
7	8500	DELAYED COKER	116		70	D-8505 Fractionator Ovhd Drum PSV	S	LP	PSV-1341	8x10	
7	8500	DELAYED COKER	129		76	E-8555A Compressor Aftercooler Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	129		77	E-8555A Compressor Aftercooler Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	129		78	E-8555B Compressor Aftercooler Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	129		79	E-8555B Compressor Aftercooler Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	131		82	E-8554A Compressor Interstage Condenser Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	131		83	E-8554A Compressor Interstage Condenser Bay 2 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	131		84	E-8554B Compressor Interstage Condenser Bay 1 Drain	MM	LP		1.5	
7	8500	DELAYED COKER	131		85	E-8554B Compressor Interstage Condenser Bay 2 Drain	MM	LP		1.5	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	132		90	D-8507 Compressor Interstage K.O. Drum PSV	S	LP	PSV-2113	8x10	
7	8500	DELAYED COKER	134		95	D-8508 Compressor High Pressure Receiver PSV	S	LP	PSV-2213	4x6	
7	8500	DELAYED COKER	137		100	T-8506 Aponge Absorber PSV	S	LP	PSV-2366	2x3	
7	8500	DELAYED COKER	139		104	D-8510 Debutanizer Overhead Drum PSV	S	LP	PSV-2457	2x3	
7	8500	DELAYED COKER	139		105	D-8510 Debutanizer Overhead Drum PSV bypass	MM	LP		2	
7	8500	DELAYED COKER	140		108	T-8509 Coker Gas Absorber PSV	S	LP	PSV-2501	4x6	
7	8500	DELAYED COKER	141		110	T-8510 LPG Contactor PSV	S	LP	PSV-2552	4x6	
7	8500	DELAYED COKER	142		111	E-8567 LPG Cooler Outlet Drain	MM	LP		1	
7	8500	DELAYED COKER	142		112	D-8529 Amine Coalescer PSV	S	LP	PSV-2611	4x6	
7	8500	DELAYED COKER	142		113	D-8529 Amine Coalescer PSV bypass	MM	LP		2	
7	8500	DELAYED COKER	145		120	D-8511 Rich Amine Flash Drum Off Gas after Absorber	AO, MO	LP		3	
7	8500	DELAYED COKER	145		121	D-8511 Rich Amine Flash Drum PSV	S	LP	PSV-2752	6x8	
7	8500	DELAYED COKER	146		124	T-8511 Naphtha Splitter PSV	S	LP	PSV-2819	8x10	
7	8500	DELAYED COKER	146		125	T-8511 Naphtha Splitter PSV bypass	MM	LP		6	
7	8500	DELAYED COKER	147		132	D-8512 Naphtha Splitter Ovhd Receiver Off Gas via HV-2855	AO, MO		HV-2855	3	
7	8500	DELAYED COKER	147		133	D-8512 Naphtha Splitter Ovhd Receiver PSV	S	LP	PSV-2856	4x6	
7	8500	DELAYED COKER	148		134	T-8507 Debutanizer Ovhd PSV	S	LP	PSV-2919	4x6	
7	8500	DELAYED COKER	148		135	T-8507 Debutanizer Ovhd PSV bypass	MM	LP		3	
7	8500	DELAYED COKER	148		136	E-8559A Debutanizer Ovhd Condenser Bay 1 Outlet drain	MM	LP		1.5	
7	8500	DELAYED COKER	148		137	E-8559A Debutanizer Ovhd Condenser Bay 2 Outlet drain	MM	LP		1.5	
7	8500	DELAYED COKER	148		138	E-8559B Debutanizer Ovhd Condenser Bay 1 Outlet drain	MM	LP		1.5	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	148		139	E-8559B Debutanizer Ovhd Condenser Bay 2 Outlet drain	MM	LP		1.5	
7	8500	DELAYED COKER	149		144	D-8535 Fuel Gas K.O. Drum Off Gas via PV-6053 bypass	MM			6	
7	8500	DELAYED COKER	149		145	D-8535 Fuel Gas K.O. Drum PSV	S	LP	PSV-6015	1.5x3	
7	8500	DELAYED COKER	182		146	T-8512 Coker Blowdown Tower Ovhd PSV	S	LP	PSV-4521	8x10	
7	8500	DELAYED COKER	182		147	T-8512 Coker Blowdown Tower Ovhd PSV bypass	MM	LP		6	
7	8500	DELAYED COKER	183		150	D-8513 Blowdown Overhead Separator PSV	S	LP	PSV-10769	8x10	
7	8500	DELAYED COKER	183		151	D-8513 Blowdown Overhead Separator PSV	S	LP	PSV-10770	8x10	
7	8500	DELAYED COKER	183		152	D-8513 Blowdown Overhead Separator PSV	S	LP	PSV-10771	8x10	
7	8500	DELAYED COKER	183		153	D-8513 Blowdown Overhead Separator PSV	S	LP	PSV-10777	8x10	
7	8500	DELAYED COKER	183		154	D-8513 Blowdown Overhead Separator PSV bypass	MM	LP		6	
7	8500	DELAYED COKER	190		162	T-8513 Oxidizer Tower PSV-2674	S	LP	PSV-2674	3x4	
7	8500	DELAYED COKER	191		165	T-8513 Oxidizer Tower Off Gas via PDV-5051	AO	LP	PDV-5051	1	
7	8500	DELAYED COKER	191		166	T-8513 Oxidizer Tower Off Gas via PDV-5051 bypass	MM	LP		1.5	
7	8500	DELAYED COKER	191		167	D-8594 DSO Gravity Separator Off Gas via PV-5054 bypass	MM	LP		2	
7	8500	DELAYED COKER	191		168	D-8594 DSO Gravity Separator PSV-2673	S	LP	PSV-2673	3x4	
7	8500	DELAYED COKER	210		174	D-8514 Heater Fuel Gas K.O. Drum PSV	S	LP	PSV-6017	1x2	
7	8500	DELAYED COKER	210		175	D-8514 Heater Fuel Gas K.O. Drum PSV bypass	MM	LP		1	
7	8500	DELAYED COKER	210		177	D-8536 Sour Fuel Gas K.O. Drum PSV	S	LP	PSV-6019	1x2	
7	8500	DELAYED COKER	215		179	D-8538 LCGO Flush Oil Surge Drum PSV	S	LP	PSV-6251	3x4	
7	8500	DELAYED COKER	215		180	D-8538 LCGO Flush Oil Surge Drum PSV bypass	MM	LP		1.5	
7	8500	DELAYED COKER	222		182	D-8537 HCGO Seal Oil Surge Drum PSV	S	LP	PSV-6601	3x4	

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Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
7	8500	DELAYED COKER	222		183	D-8537 HCGO Seal Oil Surge Drum PSV bypass	MM	LP		1.5	
7	8500	DELAYED COKER	248		186	D-8546 DCM Amine Sump Drum Off Gas via PCV-7902 bypass	MM	LP		1	
7	8500	DELAYED COKER	248		187	D-8546 DCM Amine Sump Drum PSV	S	LP	PSV-7905	1.5x3	
7	8500	DELAYED COKER	248		188	D-8546 DCM Amine Sump Drum PSV bypass	MM	LP		1.5	
7	8500	DELAYED COKER	143 & 188		191	D-8592 1st Stage Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2676	S	LP	PSV-2676	2x3	
7	8500	DELAYED COKER	143 & 189		194	D-8593 2nd Stage Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2675	S	LP	PSV-2675	2x3	
7	8500	DELAYED COKER	143 & 191		195	D-8594 DSO Gravity Separator (in MSY-8504 LPG Transfer Pkg) PSV-2673	S	LP	PSV-2673	3x4	
7	8500	DELAYED COKER	143 & 191		196	D-8594 DSO Gravity Separator (in MSY-8504 LPG Transfer Pkg) PSV-2673	MM	LP		2	
7	8500	DELAYED COKER	143 & 192		198	D-8595 Phase Separator (in MSY-8504 LPG Transfer Pkg) PSV-2672	S	LP	PSV-2672	3x4	
7	8500	DELAYED COKER	143 & 193		200	F-8580 Sand Filter (in MSY-8504 LPG Transfer Pkg) PSV-2671	S	LP	PSV-2671	2x3	
7	8700	COKER FLARE SYSTEM	27		3	D-8702 Coker Flare K.O. Drum Flare Gas	MM	LP		36	
PH2	3404	#4 GT	0003	1	2	D-3404 Raffinate Holding Drum PSV	S	7	PSV-16	3x4	
PH2	3404	#4 GT	0003	6	7	S-3424 Fuel Gas Separator Strainer Drain	MM	7		1	
PH2	3404	#4 GT	0003	6	8	E-3414 No. 4 Vaporizer PSV	S	7	PSV-106	2x3	
PH2	3405	#5 GT	0003	6	7	S-3435 Fuel Gas Separator Strainer Drain	MM	7		1	
PH2	3405	#5 GT	0003	6	8	E-3455 No. 5 Vaporizer PSV	S	7	PSV-511	2x3	
PH2	3405	#5 GT	0003	6	9	D-3458 FCC Fuel Gas K.O. Drum PSV	S	7	PSV-1	1.5x2	
PH2	3405	#5 GT	0003	6	10	D-3458 FCC Fuel Gas K.O. Drum PSV Bypass	MM	7		2	
PH2	3406	#6 GT	0003	6	5	S-3426 Fuel Gas Separator Vent	MM	7		1	
PH2	3406	#6 GT	0003	6	6	S-3426 Fuel Gas Separator Strainer Drain	MM	7		2	
PH2	3406	#6 GT	0003	6	7	E-3446 No. 6 Vaporizer PSV	S	7	PSV-806	2x3	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
PH2	3407	#7 GT	0003	6	5	S-3407 Fuel Gas Separator Vent	MM	7		1	

Appendix D - Flare Connection List

Area	Unit	Unit Name	P&ID	Sht	Item	Service Description	Release Type	Flare No.	Valve Tag	Tag Valve Size (inch)	Tag Valve Type
PH2	3407	#7 GT	0003	6	6	S-3407 Fuel Gas Separator Strainer Drain	MM	7		1.5	
PH2	3407	#7 GT	0003	6	7	E-3447 No. 7 Vaporizer PSV	S	7	PSV-6	2x3	
PH2	3408	#8 GT	0003	5	5	S-3408 Fuel Gas Separator Vent	MM	7		1	
PH2	3408	#8 GT	0003	5	6	S-3408 Fuel Gas Separator Strainer Drain	MM	7		1.5	
PH2	3408	#8 GT	0003	5	7	E-3418 No. 8 Vaporizer PSV	S	7	PSV-3416	2x3	
PH2	3409	#9 GT	0003	5	5	S-3409 Fuel Gas Separator Vent	MM	7		1	
PH2	3409	#9 GT	0003	5	6	S-3409 Fuel Gas Separator Strainer Drain	MM	7		1.5	
PH2	3409	#9 GT	0003	5	7	E-3419 No. 9 Vaporizer PSV	S	7	PSV-905	2x3	
PH2	3410	#10 GT	0007	1	1	T-3410 Fuel Gas Supply Line Strainer Drain	MM	7		1.5	
PH2	3410	#10 GT	0009		5	E-3422 Propane Vaporizer PSV	S	7	PSV-1053	1.5x2	
PH2	3410	#10 GT	0009		6	E-3422 Propane Vaporizer Level Inst. Drain	MM	7		0.75	
PH2	3410	#10 GT	0009		7	D-3427 Fuel Gas Separator PSV	S	7	PSV-1248	2x3	
PH2	3410	#10 GT	0009		8	D-3427 Fuel Gas Separator LC Drain	MM	7		1	
PH2	3410	#10 GT	0009		9	D-3427 Fuel Gas Separator LG Drain	MM	7		0.5	
UT2	1150	Boilers1-5	0003	18	2	D-1160 Treating Gas Balance Drum PSV	S	3	PSV-1191	3x4	
UT2	1150	Boilers1-5	0003	18	3	D-1160 Treating Gas Balance Drum FG Let Down	S	3	PSV-123	6x8	
UT3	3301	UT3	0006	13	5	D-3355 Boiler 6/7 Fuel Gas KO Drum PSV	S	7	PSV-157	6x8	
UT3	3301	UT3	0006	13	6	D-3358 Boiler 8/9 Fuel Gas KO Drum PSV	S	7	PSV-93	8x10	
UT3	9055	UT3	0003	6	2	D-3359 Naphtha Fuel Surge Tank PSV	S	7	PSV-62	3x4	
UT3	9055	UT3	0003	6	3	D-3359 Blanketing Gas via PV-65 bypass	MM	7		2	

APPENDIX E

**AMP APPROVAL FOR MODIFIED QA/QC
REQUIREMENTS UNDER NSPS JA**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

May 19, 2020

Mr. Brian K. Lever, President
Ms. Catherine Elizee
Limetree Bay Refining, LLC
1 Estate Hope
Christiansted, VI 00820-5652

Dear Mr. Lever and Ms. Elizee;

I am writing in response to your letter dated August 30, 2019, and received by our office on December 10, 2019, requesting approval for alternative measurement method procedures to support your compliance testing and monitoring requirements at the Limetree Bay Refining, LLC (Limetree) refinery, St. Croix, U.S. Virgin Islands. We requested additional information regarding your process mass spectrometer and received your answer on March 23, 2020. You indicate that the Limetree refinery is subject to total reduced sulfur (TRS) and hydrogen sulfide (H₂S) monitoring requirements under 40 CFR 60, Subpart Ja, Standards of Performance for Petroleum Refineries [§§60.107a(e)(1) and 60.107a(a)(2)] as well as requirements for monitoring the net heating value of gas fed to flares under 40 CFR 63, Subpart CC, National Emissions Standards for Hazardous Air Pollutants from Petroleum Refineries [§63.671(e)(2)(ii)].

As we understand, for your H₂S monitoring under §60.107a(a)(2), you are required to install, operate and maintain each H₂S continuous emission monitoring system (CEMS) according to Performance Specification 7 (40 CFR 60, Appendix B), use a span of 300 ppm H₂S, and follow Procedure 1 of 40 CFR 60, Appendix F for ongoing quality assessments. Under §60.107a(e)(1) you are required to install, operate and maintain your TRS CEMS according to Performance Specification 5 (40 CFR 60, Appendix B), using Method 15A of 40 CFR 60, Appendix A as the reference method for relative accuracy evaluations. You are also required to follow Procedure 1 for ongoing quality assessments of the TRS CEMS. You noted that the span value used for the TRS CEMS must be determined based on the maximum sulfur content of gas that can be discharged to the flare (e.g., roughly 1.1 to 1.3 times the maximum anticipated sulfur concentration) but may be no less than 5,000 ppmv. You also indicated that Subpart Ja defines reduced sulfur compounds as the aggregate of H₂S, COS, and CS₂.

Your letter requests approval of alternatives to the quality assessment procedures required for the TRS CEMS in §60.107a(e)(1):

- 1) To use an Extrel MAX300-RTG process mass spectrometer that you have already installed as your H₂S CEMS to also measure TRS;
- 2) To determine TRS by measuring and summing three specific reduced sulfur compounds, H₂S, COS, and CS₂;
- 3) To include H₂S, COS, and CS₂ in the calibration and audit gas cylinders;
- 4) To use a lower concentration cylinder gas than the minimum required 5,000 ppmv gas to perform daily TRS calibration drift (CD) checks;
- 5) To use the same gas cylinders for the span gas concentration for H₂S and TRS; and
- 6) To perform quarterly cylinder gas audits (CGAs) and alternative CGAs under §60.107a(e)(1)(ii) for TRS with reduced concentrations (see Tables 1 and 2).

Your letter also requests approval to include H₂S in the list of compounds used to meet the net heating value monitoring requirements in §63.671(e)(2).

You provided Tables 1 and 2 presented below to summarize the requested alternative cylinder gas concentrations for H₂S and TRS to meet the flare CEMS quality control and quality assurance requirements under Subpart Ja at your Limetree facility.

Table 1. Calibration Gas Concentrations for Daily CD Checks

	H ₂ S Concentration (ppmv)	TRS Concentration (ppmv)
Zero/Low Level	0-60	0-200
High Level	150-300	500-1,000

Table 2. Gas Concentrations for Quarterly Cylinder Gas Audits for Accuracy

	H ₂ S Concentration (ppmv)	TRS Concentration (ppmv)
Low Level	60-90	200-300
High Level	150-180	500-600

To support your request, you cited the National Institute of Occupational Safety and Health Immediately Dangerous to Life or Health value of 100 ppmv for H₂S and noted that Limetree seeks to limit safety hazards to its personnel. You explained that the location of the Limetree facility on St. Croix poses a unique challenge in transport/shipping of high sulfur concentration gas cylinders. There are no gas production facilities on St. Croix, so any calibration gas cylinders must be shipped to the island by boat or plane. Due to the logistics of emergency response were

there to be a leaking cylinder on a plane or boat, the gas supplier limits the concentration of shipped gases to 1000 ppmv total TRS. You also provided the manufacturer's demonstration of linearity for H₂S up to 100 percent for the Extrel MAX300-RTG process mass spectrometer and you provided manufacturers linearity for TRS using a mix of the three compounds proposed by Limetree up to a total of 80 percent TRS.

With this letter we are providing partial approval of your request in consideration of the following:

- 1) In Subpart Ja, §60.107a(e)(1)(i) specifies Performance Specification 5 (PS 5) to continuously measure TRS. PS 5 is performance-based and does not restrict the instrumentation utilized so long as the measurement meets the quality requirements in PS-5. Therefore, an alternative method approval is not needed to use the Extrel MAX300-RTG process mass spectrometer for TRS measurements under §60.107a(e)(1).
- 2) Similarly, in 2018, we issued a broadly applicable alternative test method approval (ALT-124) for use of process mass spectrometers to determine NHV_{VG} to meet the requirements in Subpart CC and we allowed affected facilities to augment the minimum list of calibration gas components found in Subpart CC §63.671(e) with compounds found during the pre-survey to develop site-specific analysis methods for NHV_{VG}. Furthermore, H₂S is an optional calibration component found in §63.671(e)(2)(i)(O). Therefore, no alternative measurement approval is needed to use the process mass spectrometer to measure H₂S and include this compound in the calculation of NHV_{VG}; however, you must use the individual component properties in Table 12 of §63.671 to calculate NHV_{VG}.

We recognize the significant safety and shipping constraints posed by the use of high sulfur cylinder gases at your facility and are approving your request to use lower concentration cylinder gas calibration and audit standards as requested and specified in Tables 1 and 2. Since this alternative test method approval primarily responds to the safety issues involved in shipping high concentration TRS and H₂S containing cylinders, it is restricted to the St. Croix Limetree Bay Refining facility noted above. A copy of this approval letter must be included in the reporting for each testing/monitoring program where these alternative procedures are applied.

If you have any questions regarding this approval or need further assistance, please contact Ray Merrill at (919) 541-5225 or merrill.raymond@epa.gov.

Sincerely,


Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Phil Cocuzza, Region 2
Gerri Garwood, EPA/OAQPS/SPPD
Carol Lynes, Region 2
Maria Malave, EPA/OECA/OC
Harish Patel, Region 2
Supriya Rao, Region 2
Brenda Shine, EPA/OAQPS/SPPD
Kai Tang, Region 2

APPENDIX F

**ALT 124 – PROCESS MASS SPECTROMETRY AS AN
ALTERNATIVE TO PS 9 TO DETERMINE BTU FOR 40
CFR PART 53 SUBPART CC FLARE FEED GAS**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

Mr. Chuck DeCarlo
Marketing Manager
Extrel CMS, LLC
575 Epsilon Drive, Suite 2
Pittsburg, PA 15238-2838

FEB 05 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Tony Slapikas
Product Manager for Mass Spectrometry
AMETEK, Energy & Process Division
150 Freeport Road
Pittsburgh, PA 15238

Dear Mr. DeCarlo and Mr. Slapikas,

I am writing in response to your letter dated August 18, 2017, requesting approval for use of process mass spectrometers as part of an alternative to testing procedures utilizing calorimeters or gas chromatographs to measure Net Heating Value (NHV_{VG}) in flare vent gas as required under 40 CFR Part 63, Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries. The owner or operator of facilities subject to Subpart CC must measure flare vent gas composition to determine NHV_{VG} in units of British Thermal Units per standard cubic foot (BTU/SCF). This BTU/SCF determination may be performed using a calorimeter capable of continuously measuring, calculating, and recording NHV_{VG} at standard conditions (40 CFR 63.670 (j)(3)) or equipment that determines the concentration of individual components in the flare vent gas (40 CFR 63.670 (j)(1)), such as a gas chromatograph, and, if desired, may directly measure the hydrogen concentration in the flare vent gas following the methods provided in 40 CFR 63.670 (j)(4). All monitoring equipment must meet the applicable minimum accuracy, calibration and quality control requirements specified in Table 13 and §63.671 of Subpart CC.

In your letter, you propose to use a process mass spectrometer analyzer and the following measurement approach as an alternative to measure NHV_{VG} :

- 1) The owner or operator of the affected facility will perform a pre-survey to determine the list and concentration of components that are present in flare vent gas feed. This pre-survey will be used in part to:
 - a) Determine an appropriate analysis method for the site-specific refinery flare vent gas;
 - b) Create a list of vent gas components to be included in calibration gas cylinders to be used to evaluate the quality of the measurement procedure used to determine NHV_{VG} ;
 - c) Define calibration standards to be prepared by a vendor at a certified accuracy of 2 percent and traceable to NIST; and
 - d) Perform an initial calibration to identify mass fragment overlap and response factors for the target compounds.

- 2) The process mass spectrometer will be calibrated using calibration gas standards consisting of a mix of the compounds identified in the site specific flare gas pre-survey.
- 3) During flare gas analysis, compounds that are not identified during the pre-survey and that have mass fragments identical to the compounds found during the pre-survey will be included in the calculation of NHV_{vd}.
- 4) Calibration error (CE) for each component in the calibration blend will be calculated using the following equation:

$$CE = \frac{C_m - C_c}{C_c} \times 100$$

Where :

C_m = Average instrument response, (ppm)

C_c = Cylinder gas value or tag value, (ppm)

- 5) The average instrument CE for each calibration compound at any calibration concentration must not differ by more than 10 percent from the cylinder gas value or tag value.
- 6) For each set of triplicate injections at each calibration concentration for each calibration compound, any one introduction shall not deviate more than 5 percent from the average concentration measured at that level.

Your supporting information included Method 301 calculations that showed acceptable bias and precision when you measured a mixture of gases from a vendor certified gas cylinder. Your request also includes reference to facilities needing to monitor flare gas composition continuously to effectively maintain flare efficiency while compensating for changes in the flare gas composition.

With this letter, we are approving your request to substitute continuous process mass spectrometry for continuous gas chromatography as allowed in 40 CFR 63.670 and 63.671 predicated on both your proposed use of these process mass spectrometers as described above and the additional provisos listed below:

- 1) You must meet the requirements in 40 CFR 63.671 (e)(1) and (2) including Table 13 requirements for Net Heating Value by Gas Chromatograph.
- 2) You may use the alternative sampling line temperature allowed in 40 CFR 63, Subpart CC, Table 13, under Net Heating Value by Gas Chromatograph.
- 3) You must meet applicable Performance Specification 9 (40 CFR part 60, appendix B) requirements for initial continuous monitoring system acceptance including, but not limited to:
 - o Performing a multi-point calibration check at three concentrations following the procedure in Section 10.1; and
 - o Performing periodic process mass spectrometer calibrations as directed for gas chromatographs in 40 CFR 63, Subpart CC, Table 13.
- 4) You may augment the minimum list of calibration gas components found in 40 CFR 63.671(e) with compounds found during the pre-survey as needed to develop a site-specific analysis method.

- 5) For unknown gas components that have similar analytical mass fragments to calibration compounds, you may report the unknowns as an increase in the overlapped calibration gas compound.
- 6) For unknown compounds that do not produce mass fragments that overlap calibration compounds, you may use the response factor for the nearest molecular weight hydrocarbon in the calibration mix to quantify the unknown component's NHV_v. This requirement parallels the requirements in 40 CFR Part 63.671 (e)(3) for gas chromatographs.
- 7) You may use the response factor for n-pentane to quantify any unknown components detected with a higher molecular weight than n-pentane.
- 8) You must meet all other applicable generic requirements of §§63.670 and 63.671 for measurement of NHV_v (i.e., measurement requirements not specifically targeted to gas chromatographs).
- 9) A copy of this approval letter must be included in the report for each testing program where these alternative testing procedures are applied.

Since this alternative test method approval under 40 CFR 63.7 (f) is appropriate for use at all facilities subject to 40 CFR 63, Subpart CC, we will announce on EPA's Web site (<https://www.epa.gov/omc/broadly-applicable-approved-alternative-test-methods>) that the alternative method is broadly applicable to determination of NHV_v under this subpart.

If you have any questions regarding this approval or need further assistance, please contact Ray Merrill at (919) 541-5225 or merrill_raymond@epa.gov, or Robin Segall at (919) 541-0893 or segall_robin@epa.gov.

Sincerely,



Robin A. Segall, Group Leader
Measurement Technology Group

cc.

Geri Garwood, EPA/OAQPS/SPPD
Maria Malave, EPA/OECA/OC
Brenda Shine, EPA/OAQPS/SPPD
EPA Regional Testing Contacts

APPENDIX G

**ALT 131 - APPROVAL TO USE NHV IN PLACE OF
COMPONENT BTU FOR SELECT QC CRITERIA IN 40
CFR 63, SUBPART CC FLARE FUEL MEASUREMENTS**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Tim Goedeker
Senior Principal Environmental Consultant
Phillips 66
2331 CityWest Blvd, S685
Houston, TX 77042

Dear Mr. Goedeker:

I am writing in response to your letter dated September 26, 2018, requesting approval for alternatives to requirements in 40 CFR 63, Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries (Subpart CC), and by reference, 40 CFR 60, Appendix B, Performance Specification 9 (PS 9) for determining Net Heating Value (NHV). You request using ± 10 percent agreement of the total calibration cylinder NHV as an alternative to the PS 9 requirement that specifies calibration and calibration check individual compound agreement of ± 10 percent with cylinder certified tag values. You are requesting this alternative for broad application to affected facilities which use Gas Chromatograph (GC) and/or Mass Spectrometer (MS) technology for composition and corresponding NHV determinations required under Subpart CC.

In your letter, you request the following specific alternatives to the quality assurance procedures required in PS 9 and §§63.671(e)(2) and (e)(3) when you demonstrate compliance with Subpart CC:

- 1) Single daily mid-level calibration check error to be calculated based on the total NHV of a certified calibration gas mixture. The instrument response for NHV shall not vary by more than 10 percent from the total NHV of the certified calibration gas mixture.
- 2) Quarterly multi-point calibration (see Table 13 of Subpart CC) error to be calculated against the total NHV of the certified calibration gas mixtures (i.e., low-, mid-, high-level). The average instrument response for total NHV shall not vary by more than 10 percent from the total NHV of any of the certified gas mixtures.

Your rationale for proposing these alternative procedures is based on the tenant that NHV is the factor utilized to determine compliance with the Subpart CC flare combustion efficiency requirement. These alternative procedures also simplify the calibration procedures for sites that elect to use them. You provided calibration check data for both GC and MS NHV determinations that show the comparability of quality control on a per compound basis with quality control on a total NHV basis.

You request these alternative procedures for use at Phillips 66 BP facilities subject to Subpart CC and provide example facilities including: Billings Refinery located at 401 S 23rd Street, Billings, MT, 59101; Ponca City Refinery located at 1000 S Pine Street, Ponca City, OK, 74601; and the Wood River Refinery located at 900 S. Central Avenue, Roxana, IL, 62084.

With this letter, we are approving your request to use the relative percent error of total NHV measured versus the certified cylinder tag value for total NHV as the measure of agreement for both the daily calibration and quarterly multi-point audits when using GC or MS for flare fuel feed NHV requirements in Subpart CC with the following provisos:

- 1) Certified gas standards must be prepared consistent with the requirements in §63.671(e)(2).
- 2) You must use certified calibration gases that meet the requirement in Section 7.1 of PS 9 for daily calibration checks.
- 3) You must use performance audit gases that meet the requirements in Section 7.2 of PS 9 for your quarterly multi-point calibration audits.
- 4) The measured NHV relative error for quarterly multi-point calibration audits must be within 10 percent of the certified cylinder gas tag value for NHV. NHV calculations must be based on the individual component properties in Table 12 of Subpart CC. This requirement replaces the compound-specific relative error requirement for performance audits in Section 7.2 of PS 9.
- 5) Mid-level daily calibration standard measurements must also be within 10 percent of the certified of the cylinder gas tag value for NHV. This requirement replaces the compound-specific relative error requirement for daily calibration in Section 10.2 of PS 9.

You must include a copy of this approval letter in the report for each testing program or periodic reporting period where these alternative testing procedures are applied.

Since this alternative test method approval under 40 CFR 63, Subpart CC, is appropriate for use at all facilities subject to Subpart CC that must determine flare combustion efficiency, we will announce on EPA's website (at <https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods>) that our approval of this alternative is broadly applicable to 40 CFR 63, Subpart CC. Should the alternative approvals authorized in this letter be superseded by formal actions to revise 40 CFR 63, Subpart CC, this approval may be rescinded.

If you have any questions regarding this approval or need further assistance, please contact Ray Merrill at (919) 541-5225 or merrill.raymond@epa.gov.

Sincerely,



Steffan M. Johnson, Group Leader
Measurement Technology Group

Cc: Jennifer Ahlskog, Phillips 66 Rodeo Refinery
Gerri Garwood, EPA/OAQPS/SPPD
Sri Kanukolanu, Phillips 66 Wood River Refinery
Maria Malave, EPA/OECA/OC
Dave Pavlich, Phillips 66 Principal Environmental Consultant
Ray Pilapil, Illinois Environmental Protection Agency
Brenda Shine, EPA/OAQPS/SPPD
EPA Regional Testing Contacts

APPENDIX H

LIST OF STARTUP AND SHUTDOWN PROCEDURES

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
0000 GENERIC		
0000-526	0238	Preparing a Line in Hydrocarbon Service for Maint.
0000-541	4173	Preparing an LPG Line for Maintenance
0000-547	4171	Recommissioning of LPG Line
0000-549	4683	Flare Maintenance Safe Work Permit Pro.
0000-550	4734	Preparation of Pumps for Maint. Containing Light Hydrocarbons
0000-555	4993	Pre-Startup Pressure Leak Test
0000-561	5219	Prepare Pumps (that may contain H2S) for Maintenance
0000-589	5934	Operations First Line Break Procedure
0000-590	5935	Refinery Sulfur Load Shedding
0000-602	6052	Depressuring or Draining of Equipment to the Flare
3100 NO. 5 CRUDE		
3100-101	766	S/U from Turnaround
3100-102	767	General /Hot
3100-106	770	Crude Heater(s)
3100-109	773	Air Preheat System
3100-112	4204	Gas Recovery Compressor
3100-115	774	Desalter(s)
3100-201	775	S/D For Turnaround
3100-202	776	General /Hot
3100-206	779	Crude Heater(s)
3100-209	782	Air Preheat System
3100-212	4205	Gas Recovery Compressor
3100-215	783	Desalter(s)
3100-216	5646	No.5CDU Shutdown PD-3114C using emergency switch 3100-HS-0469A
3100-428	810	Returning Cold Train Exchangers Back in service
3100-429	811	Returning Hot Train Exchangers Back in service
3100-485	4182	Returning Desalter Water Flash Drum/Sour Gas KO Drum Back in Service
3200 NO. 6, 7, 9 VAPORIZERS		
3200-101	0819	S/U from Turnaround
3200-102	0820	General /Hot
3200-201	0821	S/D For Turnaround
3200-202	0822	General /Hot
3201 NO. 1 LPG TREATER		
3201-101	0824	S/U from Turnaround
3201-102	0825	General /Hot
3201-201	0826	S/D For Turnaround
3201-202	0827	General /Hot
3202 DE-ISO NAPHTHA SPLITTER		
3202-101	838	S/U form Turnaround
3202-201	840	S/D fror Turnaround
3202-202	841	General / Hot
3202-453	4730	Taking Pick Heater Out of Service
3202-454	4731	Return Pick Heater (S-3201) Back in Service
3312 NO. 8 VAPORIZER		
3312-101	1065	S/U from Turnaround
3312-201	1067	S/D For Turnaround
3400 EAST POWER UTILITIES		
3400-101	2889	No. 4 Gas Turbine (G-3404) Startup after T/A or Maintenance
3400-102	2778	No. 4 Waste Heat Boiler (B-3404) Start Up After Turnaround or Maintenance.
3400-103	2779	No. 10 Waste Heat Boiler (B-3410) Startup After T/A or Maintenance
3400-105	2815	No. 10 Vaporizer Startup After Turnaround
3400-106	2853	NO. 5 Deaerator (D-3405) Startup after Turnaround
3400-109	2872	No. 4 Gas Turbine (G-3404) Normal Startup

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
3400-110	2857	No.4 Waste Heat Boiler (B-3404) Normal Startup
3400-111	2858	No. 10 Waste Heat Boiler (B-3410) Normal Startup
3400-113	2817	No. 10 GT Vaporizer Startup
3400-114	2813	No. 5 Deaerator (D-3405) Normal Startup
3400-151	3867	Startup after T/A or Maint: No.7 GT
3400-152	3868	Startup after T/A or Maint: No.8 GT
3400-153	3869	Startup after T/A or Maint: No. 9 GT
3400-154	3870	Startup after T/A or Maint: No.10 GT
3400-157	3873	Startup after T/A or Maint: No.7 WHB
3400-158	3874	Startup after T/A or Maint: No.8 WHB
3400-159	3875	Startup after T/A or Maint: No.9 WHB
3400-162	3878	Startup after T/A or Maint. No.7 VAP
3400-163	3879	Startup after T/A or Maint: No.8 VAP
3400-164	3880	Startup after T/A or Maint: No.9 VAP
3400-166	3882	Startup after T/A or Maint: No.7 DEA
3400-169	3885	Startup Normal: No.7 GT
3400-170	3886	Startup Normal:No.8 GT
3400-171	3887	Startup Normal: No.9 GT
3400-172	3288	Startup Normal:No.10 GT
3400-173	3889	Startup Normal: No.5 WHB
3400-174	3890	Startup Normal: No.6 WHB
3400-175	3891	Startup Normal: No.7 WHB
3400-176	3892	Startup Normal No.8 WHB
3400-177	3893	Startup Normal No.9 WHB
3400-180	3896	Startup Normal: No.9 VAP
3400-181	3897	Startup Normal: No. 8 VAP
3400-182	3898	Startup Normal: No.9 VAP
3400-184	3900	Startup Normal: No.7 Deaerator
3400-185	5655	Startup Normal:No.13 WHB
3400-186	5656	Startup Normal: No. 13 Gas Turbines
3400-187	5658	No.13 Gas Turbine
3400-188	5659	No.13 Waste Heat Boiler
3400-189	5660	No.13 GT Vaporizer
3400-190	5661	No.13 Vaporizer Start-up afterT/A
3400-191	5708	EPU - GT-13 Ammonia Sys. Startup After T/A
3400-192	5721	EPU - Ammonia System Normal Startup
3400-193	5722	EPU - GT- 13 HRSG Duct Burner Startup After T/A
3400-194	5729	EPU-GT-13 HRSG Duct Burner Normal Startup
3400-195	5730	EPU - Starting Up the Seal Air Blower for the Duct Burner
3400-201	2809	T/A No.4 Gas Turbine
3400-202	2810	T/A No.4 Waste Heat Boiler
3400-203	2808	T/A (WHB's 10)
3400-204	2818	T/A (VAP's 4-9)
3400-205	2819	T/A (VAP's 10)
3400-206	3129	T/A (DEA's)
3400-209	2780	No.4 Gas Turbine Normal Shutdown
3400-210	2811	No.4 WHB Normal Shutdown
3400-211	2812	General (WHB's 10)
3400-212	2850	No.4 Vaporizer Normal Shutdown
3400-213	2851	General (VAP's 10)
3400-214	3130	General (DEA's)
3400-251	3903	For T/A or Maint.: No.7 GT
3400-252	3904	For T/A or Maint.: No.8 GT
3400-253	3905	For T/A or Maint.: No.9 GT

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
3400-254	3906	For T/A or Maint.: No.10 GT
3400-257	3909	For T/A or Maint.: No.7 WHB
3400-258	3910	For T/A or Maint.: No.8 WHB
3400-259	3911	For T/A or Maint.: No.9 WHB
3400-262	3914	For T/A or Maint.: No.7 VAP
3400-263	3915	For T/A or Maint.: No.8 VAP
3400-264	3916	For T/A or Maint.: No.9 VAP
3400-266	3918	For T/A or Maint.: No.7 DEA
3400-269	3921	Shutdown Normal: No.7 GT
3400-270	3922	Shutdown Normal: No.8 GT
3400-271	3923	Shutdown Normal: No.9 GT
3400-272	3924	Shutdown Normal: No.10 GT
3400-275	3927	Shutdown Normal: No.7 WHB
3400-276	3928	Shutdown Normal: No.8 WHB
3400-277	3929	Shutdown Normal: No.9 WHB
3400-280	3932	Shutdown Normal: No.9 Vaporizer
3400-281	3933	Shutdown Normal: No.8 Vaporizer
3400-282	3934	Shutdown Normal: No.9 Vaporizer
3400-284	3936	Shutdown Normal: No.7 Deaerator
3400-285	5657	Shutdown No.13 Waste Heat Boiler
3400-286	5662	No. 13 Vaporizer
3400-287	5664	No.13 Waste Heat Boiler S/D for T/A
3400-288	5665	No.13 Gas Turbine (G-0001) S/D for T/A
3400-289	5666	No. 13 Gas Turbine (G-0001) Normal S/D
3400-290	5667	No.13 Vaporizer Shutdown for T/A or Maint.
3400-291	5706	East Power Utilil. GT-13 Ammonia Sys. Normal S/D
3400-292	5707	East Power Utilil. GT-13 Ammonia Sys. S/D for T/A
3400-293	5720	East Power Utilil. GT-13 HRSG Duct Burner Normal S/D
3400-294	5719	East Power Utilil. GT-13 HRSG Duct Burner Shutdown for T/A
3400-401	3135	Hot Layup (WHB 10)
3400-430	5713	EPU- Commissioning Fuel Gas Drum (D-0006) & Fuel Gas Separator / Coalescer (D-0003) for GT-13
3400-431	5714	EPU-GT-13 Commissioning Fuel Gas System for GT-13 WHB Duct Burner System
BL303 NO. 8 BOILER		
BL303-101	1975	No. 8 Fired Boiler (B-3303) Startup After Turnaround
BL303-102	1979	No. 8 Fired Boiler (B-3303) Normal Startup
BL303-201	1984	No. 8 Fired Boiler (B-3303) Shutdown for Turnaround
BL303-202	1988	No. 8 Fired Boiler (B-3303) Normal Shutdown
BL304 NO. 9 BOILER		
BL304-101	1976	No. 9 Boiler (B-3304) Startup After Turnaround
BL304-102	1980	No. 8 Fired Boiler (B-3304) Normal Startup
BL304-201	1985	No. 9 Boiler (B-3304) Shutdown for Turnaround
BL304-202	1989	No. 9 Fired Boiler (B-3304) Normal Shutdown
BL305 NO. 10 BOILER		
BL305-103	4861	Initial Startup
BL305-102	4860	Normal Startup
BL305-104	5200	Starting Forced Draft Fan "VO" LubriMist Oil Mist Generator
BL305-101	4859	Pre-Startup After Turnaround
BL305-202	4863	Normal Shutdown
BL305-201	4862	Shutdown for Turnaround
4200 NO. 3 VACUUM		
4200-101	1081	S/U from Turnaround
4200-102	1082	General /Hot
4200-103	3548	Overhead Condenser System
4200-105	1084	Temperate Water System

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
4200-106	1085	Heater(s)
4200-109	1088	Air Preheat System
4200-110	3549	Cutterstock System from Turnaround
4200-111	4775	Cutterstock System (General/Hot)
4200-112	3970	Nash Compressor (C-4201-A/B)
4200-201	1089	S/D For Turnaround
4200-202	1090	General /Hot
4200-203	3550	Overhead Condenser System
4200-205	1092	Temperate Water System
4200-206	1093	Heater(s)
4200-209	1096	Air Preheat System
4200-210	3551	Cutterstock System for Turnaround
4200-211	3593	Cutterstock System (General/Hot)
4200-212	3971	Nash Compressor
4300 NO. 7 DISTILLATE DESULFURIZER		
4300-101	1129	S/U from Turnaround
4300-102	1130	General /Hot
4300-105	2722	Temperate Water System
4300-106	1131	Heater(s)
4300-112	3992	Recycle Gas Compressors
4300-113	5463	Amine Scrubber (T-4302)
4300-201	1132	S/D For Turnaround
4300-202	1133	General /Hot
4300-205	2728	Temperate Water System
4300-206	1134	Heater(s)
4300-212	3991	Recycle Gas Compressors
4300-213	5464	Amine Scrubber (T-4302)
4300-214	5631	Reactor Quench
4300-444	1155	Catalyst Presulfiding
4300-445	1156	Catalyst Prewet
4300-447	5298	Catalyst Sulfiding
4400 NO. 3 HYDROBON		
4400-101	1159	S/U from Turnaround
4400-102	1160	General /Hot
4400-105	2973	Temperate Water System
4400-106	1161	Heater(s)
4400-112	4005	Recycle Gas Compressors
4400-201	1163	S/D For Turnaround
4400-202	1160	General /Hot
4400-206	1165	Heater(s)
4400-212	3994	Recycle Gas Compressors (C-4401-A/B/C)
4400-444	1192	Presulfiding
4400-445	1193	Prewet Operation
4400-448	5228	Catalyst Sulfiding
4400-449	5552	Operations of Stripper Bottoms EIV (XV-0134)
4400-450	5553	Operations of LP Separator EIV (XV-5021)
4400-451	5554	Operations of Fractioator Reboiler EIV (XV-5022)
4400-452	5555	Operations of Stripper Reboiler EIV (XV-0135)
4600 NO. 6 DISTILLATE DESULFURIZER		
4600-101	1200	S/U from Turnaround
4600-102	1201	General /Hot
4600-105	1202	Temperate Water System
4600-106	1203	Heater(s)
4600-112	3999	Recycle Gas Compressors

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
4600-117	1204	Amine Scrubber
4600-118	2792	Jacket Water System
4600-119	2794	Auxiliary Cooling Water System
4600-201	1205	S/D For Turnaround
4600-202	1206	General /Hot
4600-205	1207	Temperate Water System
4600-206	1208	Heater(s)
4600-212	3993	Recycle Gas Compressors
4600-217	1209	Amine Scrubber
4600-218	2793	Recycle Gas Compressor Jacket Water System
4600-219	2725	Auxiliary Cooling Water System
4600-222	5524	Reactor Quench Procedure
4600-445	1233	Catalyst Prewet
4600-446	4997	N2 Purge for Reciprocating Compressor
4600-447	5257	Catalyst Sulfiding
4740 NO. 3 SULFUR RECOVERY		
4740-101	1480	S/U from Turnaround
4740-118	2745	Incinerator from T/A
4740-119	2742	Combustion Air Blower
4740-120	2746	Incinerator - From a Hot Shutdown
4740-201	1482	S/D For Turnaround
4740-202	1483	General /Hot
4740-218	2869	Incinerator for Turnaround
4740-219	3066	Combustion Air Blower
4740-413	1494	Fuel Gas Switch to Acid Gas
4740-416	1495	Introducing Ammonia Acid Gas
4740-425	1497	Hot Standby
4740-457	2798	Catalyst Regeneration
4740-480	3033	Switching Clean Acid Gas Control Mode (Pressure/Flow)
4740-602	3030	Switching Combustion Air Blower
4750 NO. 4 SULFUR RECOVERY		
4750-101	3023	S/U from Turnaround
4750-201	2824	S/D For Turnaround
4750-202	2789	Shutdown (Hot)
4750-221	2827	Shutdown of Burner
4750-413	2739	Fuel Gas Switch to Acid Gas
4750-416	2900	Introducing Ammonia Acid Gas
4750-425	2734	Hot Standby
4750-457	2799	Catalyst Regeneration
4750-459	6093	Ammonia Acid Gas Firing without Clean Acid Gas
4750-602	2743	Switching Combustion Air Blower
4760 TGTU		
4760-101	NEW	S/U from Turnaround
4760-104	NEW	Absorber T-4763 S/U
4760-105	NEW	Quench T-4762 S/U
4760-201	NEW	Shutdown For Turnaround
4760-203	NEW	Shutdown Absorber
4810 LEAN OIL ABSORBER DISULFIDE		
4810-101	958	S/U from Turnaround
4810-102	959	Hot Startup
4810-201	960	S/D For Turnaround
4810-202	961	General /Hot
4820 NO. 2 LPG TREATER		
4820-101	0969	S/U from Turnaround

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
4820-102	0970	General /Hot
4820-201	0971	S/D For Turnaround
4820-202	0972	General /Hot
4820-436	0981	Merx Catalyst Addition
4830 NO. 4 AMINE REGENERATION		
4830-101	969	S/U from Turnaround
4830-102	984	General /Hot
4830-186	4244	Precoat Filters
4830-201	0987	S/D For Turnaround
4830-202	0988	General /Hot
4830-236	4242	Precoat Filters
4830-237	5644	Amine Transfer Switch for Area1 & 3
4830-401	4045	Hot Circulation
4830-404	2791	Unit Switching to East and West Refinery Service
4830-434	1000	Amine Addition
4830-437	1001	Amine Transfer
4840 HP FUEL GAS TREATING		
4840-101	1005	S/U from Turnaround
4840-102	1006	General /Hot
4840-201	1007	S/D For Turnaround
4840-202	1008	General /Hot
4850 NO. 2 GAS RECOVERY		
4850-101	1014	S/U from Turnaround
4850-102	1015	General /Hot
4850-105	4207	Temperate Water System
4850-112	4208	Gas Recovery Compressor
4850-201	1016	S/D For Turnaround
4850-202	1017	General /Hot
4850-205	4203	Temperate Water System
4850-212	4209	Gas Recovery Compressor
4850-462	3805	Re-routing East Refinery Low Pressure Sour Off-Gas to No.5/6 CDU
4860 NO. 3 LPG FRACTIONATOR		
4860-101	1025	S/U from Turnaround
4860-102	1026	General /Hot
4860-201	1027	S/D For Turnaround
4860-202	1028	General /Hot
4860-453	5296	Routing Deethanizer Off Gas Around LPG Surge Drum (D-4864)
4860-629	1042	Startup of Butane Booster Pump
5300 NO. 9 DISTILLATE DESULFURIZER		
5300-101	1236	S/U from Turnaround
5300-102	1237	General /Hot
5300-105	2723	Temperate Water System
5300-106	1238	Heater(s)
5300-112	1265	Makeup & Recycle Gas Compressor (C-5301-A/B/C)
5300-201	1239	S/D For Turnaround
5300-202	1240	General /Hot
5300-205	2729	Temperate Water System
5300-206	1241	Heater(s)
5300-212	3998	Makeup & Recycle Gas Compressors (C5301-A/B/C)
5300-402	3976	Verification of Compressor Discharge PSV Gate Valve Position
5300-406	3997	Switching Hydrogen Compressor Loads (C-5301-A/B/C)
5300-446	5301	Catalyst Sulfiding
5400 NO. 4 HYDROBON		
5400-101	1266	S/U from Turnaround

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
5400-102	1267	General /Hot
5400-105	3764	Temperate Water System
5400-106	1268	Heater(s)
5400-112	3977	Makeup & Recycle Gas Compressor (C-5401-A/B/C)
5400-201	1270	S/D For Turnaround
5400-202	1271	General /Hot
5400-206	1272	Heater(s)
5400-212	3980	Makeup & Recycle Gas Compressor (C-5401-A/B/C)
5400-406	3979	Switching of Makeup and Recycle Gas Compressor (C-5401-A/B/C)
5400-445	1300	Catalyst Prewet Operation
5400-448	5229	Catalyst Sulfiding
5400-449	5627	Operations of Stripper Reboiler EIV (XV-5036)
5400-450	5628	Operations of Stripper Bottom EIV (XV-5037)
5450 NO. 4 PLATFORMER		
5450-101	1118	S/U from Turnaround
5450-102	0243	General /Hot
5450-106	0244	Heater(s)
5450-108	0245	Waste Heat Boiler
5450-110	0246	Surface Condenser System
5450-112	0247	Recycle Gas Compressor
5450-201	0248	S/D For Turnaround
5450-202	0249	General /Hot
5450-205	0250	Temperate Water System
5450-206	0251	Platforming Reactor and Fractionator Heater (s)
5450-208	2831	Waste Heat Boiler
5450-210	0268	Surface Condenser System
5450-212	3982	Recycle Gas Compressors
5450-406	4760	Catalyst Regeneration
5450-409	5401	Catalyst Change Carbon Burn
5450-410	5629	Operations of Fractionator Reboiler EIV (XV-1219)
5450-411	5630	Operation of the Low Pressure Separator EIV XV-5034
5450-415		New Catalyst Preparation
5450-626	4186	Recycle Compressor Water Wash
5830 NO. 5 AMINE REGENERATION		
5830-101	1043	S/U from Turnaround
5830-102	1044	General /Hot
5830-111	1045	Charcoal Filter
5830-116	1046	Amine Reclaimer
5830-186	4245	Precoat Filters
5830-201	1047	S/D For Turnaround
5830-202	1048	General /Hot
5830-211	1049	Charcoal Filters
5830-216	1050	Amine Reclaimer
5830-236	4243	Precoat Filters
5830-434	1060	Amine Addition
5830-437	1061	Amine Transfer
5830-454	1064	Treating Precoat Filters
5830-455	5089	Put Unit on Total East to West Transfer
7450 NO. 6 AMINE REGENERATION		
7450-12	2385	Cold Startup
7450-19H		Shotpot Operations
7450-19B		Absorber Skimming
7450-19G		Shotpot Operations
7460 NO. 7 AMINE REGENERATION		

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
7460-14		Startup After Turnaround
7940 NO. 8 LP FLARE		
7940-12		Startup after Turnaround
7940-15		Shutdown
7940-19A		Environmental Reporting
7940-19B		Switching No. 7 To No. 8 Flare
8500 COKER		
DCU-SU-101	5102	Prepare for Startup
DCU-SU-102	5103	Commission Air Systems
DCU-SU-103	5104	Commission Condensate and Steam Systems
DCU-SU-104	5105	Commission Nitrogen, BFW, and Fuel Gas Systems
DCU-SU-105	5106	Commission Water and Oil Mist Systems
DCU-SU-106	5107	Commission Flare System
DCU-SU-107	5108	Commission Seal Oil Systems
DCU-SU-108	5109	Commission Flush Oil Systems
DCU-SU-109	5110	Commission Feed Circuit
DCU-SU-110	5111	Line Up Merichem for Air Free
DCU-SU-112	5112	Water Fill, Air Free, and Pressure Test Merichem
DCU-SU-114	5113	Establish Circulation Thru Merichem
DCU-SU-120	5114	Line Up Amine Flash Drum for Air Free
DCU-SU-122	5115	Steam Out, Air Free, and Pressure Test Amine Flash Drum
DCU-SU-124	5116	Establish Amine Circulation
DCU-SU-130	5117	Line Up Gas Concentration Unit for Air Free
DCU-SU-132	5118	Steam Out, Air Free, and Pressure Test Gas Concentration Unit
DCU-SU-134	5119	Establish Lean Oil/Sponge Oil Circulation
DCU-SU-136	5120	Warm Up Debutanizer and Strip
DCU-SU-140	5121	Line Up Fractionator for Air Free
DCU-SU-142	5122	Steam Out, Air Free, and Pressure Test Fractionator
DCU-SU-143	5123	Naphtha Wash Fractionator
DCU-SU-144	5124	Circulate Gas Oil
DCU-SU-146	5125	Warm Up Frac and Associated Equipment
DCU-SU-150	5126	Line Up Blowdown for Air Free
DCU-SU-152	5127	Steam Out, Air Free, and Pressure Test Blowdown
DCU-SU-153	5128	Circulate and Heat Up Blowdown
DCU-SU-153a	5129	Start-Up H-8501A Heater on Natural Draft
DCU-SU-153b	5130	Start-Up H-8501B Heater on Natural Draft
DCU-SU-158	5131	Commissioning DCM Sump System
DCU-SU-159	5132	Commissioning DCB Sump System
DCU-SU-160	5356	Start-Up DCU PSA Nitrogen Skid
DCU-SU-162	5133	Air Free Coker Gas Compressor
DCU-SU-164	5134	Bring Coker Gas Compressor Online
DCU-SU-164a	5203	Restart of Coker Gas Compressor
DCU-SU-170	5135	Warm Up Drum for Initial Drum Switch
DCU-SU-172	5136	Perform Initial Drum Switch And Line Out Unit After Initial Drum Switch
DCU-SU-174	5137	Warm Up for 2nd Drum Switch
DCU-SU-176	5138	Switch 2nd Drum and Line Out Unit
DCU-SU-180	5139	Line Up and Steam Out Naphtha Splitter
DCU-SU-182	5140	Steam Out, Air Free, and Pressure Test Naphtha Splitter
DCU-SU-183	5141	Establish Naphtha Circulation Through Naphtha Splitter
DCU-SU-184	5558	Coker Start Up After Turnaround (Minimal Flaring)
DCU-SU-185	5641	Startup of Heaters, H-8501 A/B
DCU-SU-186	5976	DCU Storm-Water Sump Vapor Recovery Equipment
8500-207	4891	Shutdown of HCGO Stripper Circuit
8500-215	4897	Shutdown of Antiform System

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
8500-219	4875	Shutdown LPG Amine Contactor (T-8510)
8500-223	4906	Shutdown of Oil Mist System
8500-224	4900	Shutdown Plant Air Compressor
8500-225	4974	Shutdown Coker Gas Compressor (C-8501)
DCU-SD-202	5142	Place Heater A in Hot Oil Circulation
DCU-SD-204	5143	Place Heater B to Hot Oil Circulation
DCU-SD-210	5144	Shut Down Heater A and B
DCU-SD-211	5145	Steam Out Heaters
DCU-SD-212	5146	Deinventory Main Fractionator
DCU-SD-213	5147	Depressure and Steam Fractionator
DCU-SD-214	5148	Deinventory Blowdown
DCU-SD-215	5149	Depressure and Steam Out Blowdown
DCU-SD-221	5150	Deinventory Gas Concentration Unit
DCU-SD-223	5151	Depressure Gas Concentration Unit to Flare
DCU-SD-224	5152	Deinventory Merichem
DCU-SD-225	5153	Depressure and Steamout Merichem
DCU-SD-226	5154	Water Wash Merichem
DCU-SD-230	5155	Steam Out Debutanizer
DCU-SD-231	5156	Steam Out Primary Absorber, Stripper, Sponge Absorber, and HP Receiver
DCU-SD-233	5157	Steam Out Naphtha Splitter
DCU-SD-234	5158	Steam Out Amine Flash Drum
DCU-SD-235	5159	Water Wash Rich Amine Flash Drum
DCU-SD-236	5160	Steam Out LPG Contactor/Coalescer
DCU-SD-237	5161	Water Wash LPG Contactor/Coalescer
DCU-SD-238	5162	Steam Out Coker Gas Absorber/Coker Gas Knockout Drum
DCU-SD-239	5163	Water Wash Coker Gas Absorber/Coker Gas Knockout Drum
DCU-SD-240	5164	Shut Down Coker Gas Compressor
DCU-SD-241	5556	DCU Shutdown - Minimal Flaring
DCU-SD-242	5578	Flushing, De-Inventory, Chemical Clean and Steam out of Battery Limit Piping and Associated Equipment for T/A
DCU-SD-243	5977	DCU Storm-Water Sump Vapor Recovery Equipment
DCU-SD-244	5984	Shutdown H-8501A or B for Pig Decoking
8500-402	4980	Cutting Coke Drum
DCU-OP-401	5610	Coke Drum Preparation, Switching, Quenching, Draining, and Unheading
DCU-OP-406	5978	DCU Stormwater Sump Vapor Recovery Equipment
8500-501	4928	Prepare Furnace Charge Pump (P-8503) for Maintenance
8500-502	4929	Prepare Coker Gas Compressor (C-8501) for Maintenance
8500-503	4930	Prepare Lube Oil System for Maintenance (C-8501)
8500-504	4931	Prepare Coker Heater (H-8501 A/B) for Maintenance
8500-505	4932	Prepare Jet Pump for Maintenance
8500-509	4953	Startup Hot Oil Pumps
8500-510	4954	Prepare Fractionator Recirculation Pump P-8502 Strainers S-8502
8500-511	4955	Prepare HCGO Pump P-8504 A/B Strainers S-8503 A/B for Maintenance
8500-512	4956	Prepare HCGO Product Filters S-8504 A-D for Maintenance
8500-513	4957	Prepare Blowdown Tower Bottoms Pumps P-8522 A/B S-8505 A/B Strain
8500-514	4958	Prepare HCGO Seal Oil Filters S-8511 A/B for Maintenance
8500-515	4959	Prepare P-8524 Decoking Jet Pump Suction Strainer S-8508 for Maintenance
8500-516	4960	Prepare P-8523 A/B Quench Water Pump Strainer S-8509 for Maintenance
8500-601	4876	Start-up of the Fractionator Recirculation Pump after Maintenance
8500-602	4933	Prepare Fractionator Recirculation Pump (P-8502) for Maintenance
8500-605	4934	Startup Of Coker Heater Charge Pump (P-8503) After Maintenance
8500-607	4935	Preparing HCGO Pumps (P-8504 A/B, P-8509A/B) for Maintenance
8500-608	4961	Heater Tube on Line Spalling
8500-609	4877	Steam Air Decoking Feed Heater (H-8501A and H-8501B)
8500-611	5100	Lock Out Coke Drums for Operations
8500-612	5171	Caustic Change Out Merichem Unit

LBR STARTUP AND SHUTDOWN PROCESS PROCEDURES

Dept.Design No.	Proc. No.	Procedure Title
8500-613	5739	Switching out of a Coke Drum to a Trip or Shutdown of the Delayed Coker Heater (s)
DCU-SP-619	5239	Restart Naphtha Splitter
DCU-SP-620	5330	Steam Out HCGO Product Filter for Preventative Maintenance
DCU-SP-621	5525	Water Fill Merichem for Water Wash/Chemical Wash in Preparation for Maintenance
DCU-SP-622	5569	Prepare Furnace Charge Pump (P-8503) for Maintenance and Recuiting (P-8503 Back into Service)
DCU-SP-623	5740	Preparing E-8503 Exchangers for Maintenance and Returning Back into Service After Maintenance

APPENDIX I

FUEL GAS IMBALANCE PROCEDURE

Procedure to Minimize Flaring During Fuel Gas Imbalance

The facility is not tied into the island's power grid and therefore must produce all the electrical power (and steam) that it needs by burning fuel gas. The current configuration of the refinery does not include the FCC unit, which used to be the largest fuel gas producer at the site. For these reasons, the current refinery configuration will be "fuel gas short". Limetree does not have access to natural gas and purchases propane to supplement the fuel gas produced at the refinery in order to meet the facility's energy needs. The refinery strives to maximize the capture of refinery fuel gas to be utilized by refinery turbines, heaters, boilers and other refinery fired sources, and to reduce the need for purchased propane.

Limetree would only be fuel gas long if fuel gas consumers are temporarily offline, which would trigger an automatic response from the system to cut down on its use of purchased propane as much as possible. If there is excess fuel gas after removing all purchased propane, refinery fuel gas will be sent to the flare until fuel gas consumers are back on line.